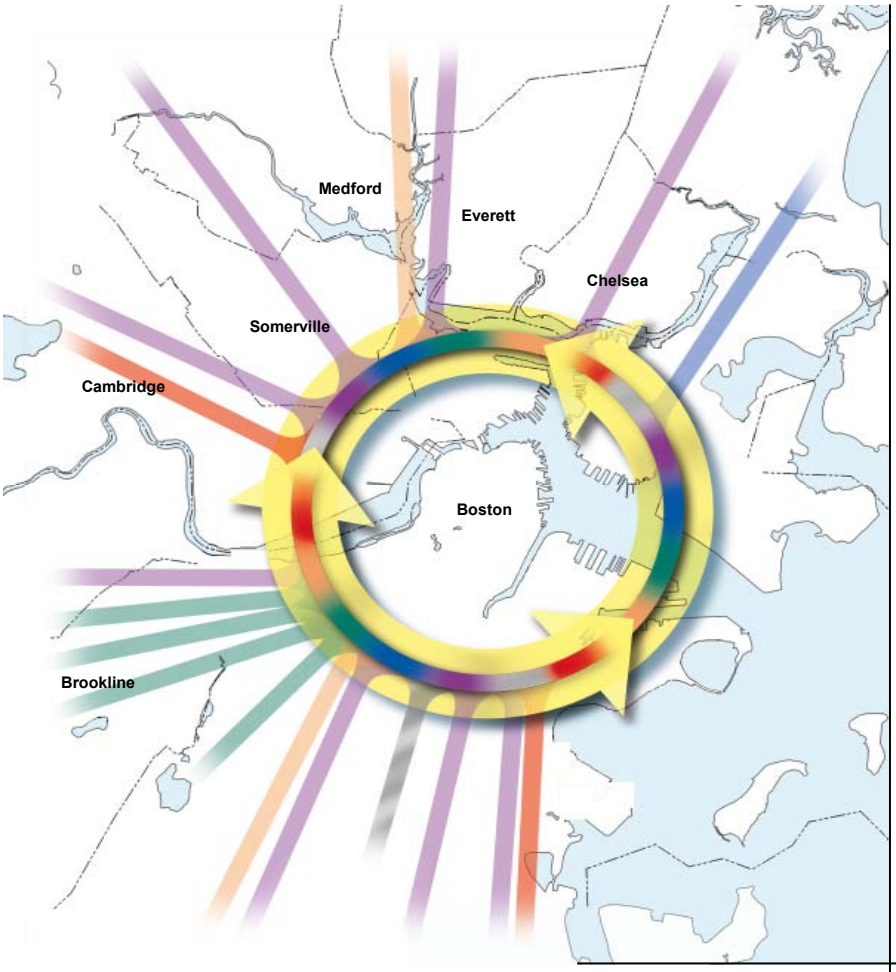

Circumferential Transportation Improvements in the Urban Ring Corridor

Urban Ring Phase 2

TECHNICAL AIR QUALITY REPORT

November 2008

MASSACHUSETTS EXECUTIVE OFFICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Transit Administration

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TECHNICAL AIR QUALITY REPORT

1 Introduction

Modeling was performed to evaluate the air quality affect of motor vehicles in the Urban Ring regional project area. Both microscale and mesoscale analyses were completed. These studies were conducted in accordance with the Secretary's Certificate on the Environmental Notification Form and an air quality modeling protocol developed in cooperation with the Massachusetts DEP[1].

The microscale analysis is designed to evaluate concentrations of carbon monoxide (CO) near project area intersections, busy roadways, and the busiest bus stations for comparison to state and federal air quality standards. The mesoscale analysis provides an assessment of emissions of volatile organic compounds (VOC), oxides of nitrogen (NOx), particulates (both PM10 and PM2.5), and the greenhouse gas carbon dioxide (CO_2) from motor vehicles in the project area.

2 Microscale Analysis

The microscale analysis was conducted to evaluate the affect of project area traffic on CO concentrations at sensitive receptors, both with and without construction of the project. CO is used to indicate roadway air pollutant levels since it can result in "hot spot" locations around congested intersections and in areas having high traffic volumes. Since CO emissions from motor vehicles are greatest during the idling, and acceleration and deceleration operating modes, the microscale study included modeling of sensitive receptors around three project area intersections. Additional modeling of CO concentrations was conducted of free flow volumes along the six busiest roadways and the six busiest bus stations.

State and National (federal) Ambient Air Quality Standards have been established for CO to protect the public health and welfare. The federal standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. Commonwealth of Massachusetts standards are the same as the federal standards Air quality modeling techniques (computer simulation programs) are used to predict CO levels for both existing and future conditions.

The microscale analysis examined the following cases:

Case	Year	Project Status
1	2006	Existing
2	2030	No-Build
3	2030	Build Baseline
4	2030	LPA (Preferred Build)

For each case, the recommended EPA computer programs EPA MOBILE6.2.03[3] and CAL3QHC[4] were used to calculate CO motor vehicle emissions and concentrations at receptors.

2.1 Motor Vehicle Emissions

The EPA MOBILE6.2.03 model was used to estimate vehicle emissions based on electronic input data files provided by the Massachusetts DEP (Craig Woleader and Marc Bennett, 1/12/2007). These input files assume the following:

- Massachusetts specific Registration Distribution, by vehicle age, for all study years (2005_REG.D)

- Massachusetts specific Inspection/Maintenance Program and Cutpoints (MA_IM06.D, MA06_CUT.D, MA30_IM.D, and MA30_CUT.D)

- Anti-tampering program

- Start Year: 2000
- First Model Year: 1984
- Last Model Year: 2050
- Vehicle Types Subject to Inspection: HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B, and Gasoline Buses
- Inspection Frequency: Biennial
- Compliance Rate: 96%
- Inspections Performed: All Except Tailpipe Lead Deposit, Fuel Inlet Restrictor & Evaporative System Tests

- Stage II program:

- Start Year: 1991
- Phase In Period: 3 Years
- 84% System Efficiency for Refueling Emissions for LDGVs and LDGTs
- 84% System Efficiency for Refueling Emissions from HDGVs

- Massachusetts specific phase-in fractions for Tier 2 exhaust and evaporative emission standards, and Massachusetts specific Tier 2 50,000 mile (50K) certification standards (LEV2EXH.D, LEV2EVAP.D, and LEV2CERT.D).

- Massachusetts specific 1994 and later fleet penetration fractions for light duty gasoline vehicles under the LEV emissions standard program (MA_LEV2.D)

- Diesel rebuild effects: 0.10

- Minimum and maximum daily temperatures of 35°F and 45°F (winter)

- Absolute humidity: 75 grains/lb

- Fuel RVP of 13.5 psi (winter)

- Reformulated gasoline program for northern region

- Sulfur content of gasoline: 30 ppm (2006 and 2030)

- Sulfur content of diesel: 350 ppm (2006) and 15 ppm (2030)

- Low altitude region

- January 1st emission rates (winter)

- One average speed per roadway link - all vehicle types (using AVERAGE SPEED option with 100% arterials)

For all buses in 2030, MOBILE6.2.03 emissions were used as these factors are based on the standards that will be required for 2030.

MOBILE6.2.03 model output is included at the end of this report.

2.2 Intersections Modeled and Traffic Data

Based on the traffic analysis, the microscale study focused on intersections in the project study area. Three (3) project area intersections were selected for this component of the microscale evaluation. The criteria for selecting the intersections involved identifying the intersections with the twenty (20) greatest traffic volumes, and then selecting from this list the intersection with the highest traffic volume and the two intersections with the worst Level-of-Service (LOS). The intersections with the 20 greatest volumes (ordered from highest to lowest) under the LPA (preferred build alternative) included the following:

1) Wellington Circle (PM)
2) Route 28 Fellsway/Shore Drive/Assembly Square (AM)

3) MCB/Massachusetts Ave (AM)
4) Santilli Circle West at Route 16 (PM)
5) Route 28 Fellsway/Middlesex (AM)
6) Route 28 Fellsway/Mystic Ave (north) (AM)
7) Route 28 Fellsway/Mystic Ave (south) (PM)
8) MCB/Massachusetts Ave (PM)
9) Route 28 Fellsway/Mystic Ave (south) (AM)
10) BU Bridge/Commonwealth Ave (PM)
11) Brookline Avenue/Boylston Street/Park Drive (PM)
12) Lombardi Way/Mystic Ave (PM)
13) McGrath Hwy/Broadway (PM)
14) BU Bridge/Commonwealth Ave (AM)
15) Boulevard/Charles River Dam (AM)
16) Brookline Avenue/Boylston Street/Park Drive (AM)
17) Boulevard/Charles River Dam (PM)
18) RBP/Lewis Street (PM)
19) RBP Second Street (PM)
20) MCB/Tremont Street (PM)

The three (3) "worst case" intersections selected and evaluated include the intersection of Brookline Avenue/Boylston Street/Park Drive (Boston), the intersection of Revere Beach Parkway (RBP) at Second Street (Everett), and Wellington Circle (Medford). For this third location, Wellington Circle as it exists today was modeled for the existing case, while the proposed reconfigured intersection with depressed Route 16 was modeled for the 2030 future year cases. The Wellington Circle location (PM case) with proposed reconfiguration is projected to have the greatest traffic volumes in the future. The Brookline Avenue/Boylston Street/Park Drive (AM case) and Revere Beach Parkway at Second Street (PM case) intersections have the worst LOS (i.e., greatest delays). These intersections are all signalized.

Sensitive receptors were located around these intersections, based on site characteristics and Environmental Protection Agency (EPA) guidance. Consistent with EPA guidelines, receptors were situated where maximum ambient CO concentrations are likely to occur (i.e., near intersection vehicle queues) and where the general public is likely to have access (i.e., walkways or sidewalks directly adjacent to roadways). Further, following EPA guidance receptors were located 3 meters laterally from each roadway, as "sidewalk" receptors; and then positioned at 3 meters, 25 meters, 50 meters, 75 meters … from the intersection. For receptors further from the intersection, CO concentrations are expected to be lower.

Peak one-hour traffic volumes and turning movements, based on the traffic analysis, were used to assess one-hour CO concentrations. Free flow roadway speeds utilized in the study are shown in Table 1.

For the peak eight-hour period, roadway concentrations were calculated using an eight-hour to one-hour ratio (or persistence factor) of 0.70 as recommended by the EPA[2]. This persistence factor accounts for the variability in meteorology over an eight-hour period as compared to one-hour conditions. Eight-hour concentrations were calculated by multiplying predicted one-hour levels by this persistence factor.

Table 1: Intersection Roadway Free Flow Speeds

Intersection	Roadway	Free Flow Speed (mph)
Brookline Avenue/ Boylston Street/Park Drive	Brookline	25
	Boylston	25
	Park	25
RBP/Second Street	RBP	40
	Second Street, north of intersection	25
	Second Street, south of intersection	30
Wellington Circle	Fellsway	30
	Middlesex	30
	Route 16	40
	Ramps (future case)	25

2.3 CO Modeling Analysis

The EPA CAL3QHC[4] computer program was used to predict CO concentrations at sensitive receptor locations around the intersections analyzed. The CAL3QHC program utilizes the FHWA CALINE3 line source dispersion model[5] and a routine that internally estimates the length of the queues of vehicles at signalized intersections. CAL3QHC evaluates air pollution concentrations near highways and arterial streets due to emissions from motor vehicles operating under free flow conditions and emissions from idling vehicles in queues at intersections.

CAL3QHC requires input of roadway geometries, receptor locations, meteorological conditions, signal timings, traffic volumes and vehicular emission rates. The following meteorological data and inputs were used:

- P-G Stability Class D
- 1.0 meter per second (m/s) wind speed.
- Wind direction modeled every 10º, from 10º to 360º.
- Mixing Height: 900 meters.
- Deposition/Settling Velocity: 0.0 m/s.
- Surface Roughness (z_o): 175 cm.
- Averaging Time: 60 minutes.
- Source Height: 0.33 meters.
- Mixing Zone for Free Flow Links: Width of traffic lanes plus 3 meters (10 feet) on each side.

2.4 Background Air Quality

An air quality analysis also requires an estimate of "background" air quality levels, representing the contribution of all sources in the project area less the specific intersections analyzed. Background levels of 5.0 ppm for the peak one-hour and 3.0 ppm for the peak eight-hour were used for all cases, as defined by the DEP.

2.5 Results of Intersection Analysis

Maximum predicted one- and eight-hour CO concentrations at sensitive receptor locations for each modeled scenario are presented in Table 2. These values represent highest expected concentrations as they are predicted during the simultaneous occurrence of defined "worst-case" meteorology and peak traffic conditions. Total concentration results are based on the contribution from the intersection studied and background CO levels.

The results in Table 2 demonstrate that no exceedances of the one- or eight-hour air quality standards for CO are predicted for any case. Further, CO concentrations are expected to improve in the future for all 2030 cases.

Table 2: Maximum CO Concentrations at Study Intersections

Intersection	2006 Existing 1-Hour (ppm)	2006 Existing 8-Hour (ppm)	2030 No-Build 1-Hour (ppm)	2030 No-Build 8-Hour (ppm)	2030 Baseline Build 1-Hour (ppm)	2030 Baseline Build 8-Hour (ppm)	2030 Build LPA 1-Hour (ppm)	2030 Build LPA 8-Hour (ppm)
Wellington Circle/ Reconfiguration	9.8	6.4	7.4	4.7	7.4	4.7	7.4	4.7
Brookline/Boylston /Park	7.5	4.8	7.2	4.5	7.2	4.5	7.2	4.5
Revere Beach Parkway/Second Street	7.9	5.0	7.5	4.8	7.5	4.8	7.5	4.8
NAAQS/MAAQS	35.0	9.0	35.0	9.0	35.0	9.0	35.0	9.0

2.6 Modeling of the Six Busiest Roadway Sections

Maximum predicted one- and eight-hour CO concentrations were also modeled at sensitive receptors along the six busiest roadway sections based on free flow conditions. The six busiest roadway sections in the project area and modeled speed, as provided by the traffic engineers, are as follows:

- Revere Beach Parkway, west of Santilli Circle (40 mph)
- McGrath Highway, north of Pearl Street (45 mph)
- Melnea Cass Boulevard, southeast of Tremont Street (40 mph)
- Melnea Cass Boulevard, west of Mass Avenue (40 mph)
- Morrissey Boulevard, north of JFK/UMASS Driveway (40 mph)
- Fellsway, McGrath Highway to Wellington (40 mph)

Traffic volumes for each roadway are given in Table 3.

For each case, modeling was based on the EPA MOBILE6.2.03[3] and CAL3QHC[4] models and assumptions described above for the intersection analysis. Receptors were located at the end and middle of approximate half mile roadway segments. Background concentrations of 5.0 ppm (one-hour) and 3.0 ppm (eight-hour) were included for each case modeled.

Table 3: Busiest Roadways – Peak Traffic Volumes (Vehicles per Hour)

Roadway	2006	2030 No-Build	2030 Build Baseline	2030 LPA
Revere Beach Parkway, west of Santilli Circle (PM)	5,051	7,004	7,076	7,004
McGrath Highway, north of Pearl Street (PM)	3,687	4,247	4,247	4,247
Melnea Cass Boulevard, southeast of Tremont Street (PM)	2,274	3,646	3,706	3,658
Melnea Cass Boulevard, west of Mass Avenue (AM)	2,874	3,755	3,755	3,755
Morrissey Boulevard, north of JFK/UMASS Driveway (PM)	4,291	5,694	5,694	5,694
Fellsway, McGrath Highway to Wellington (AM)	4,673	7,804	7,876	7,852

Results of the modeling for these six roadways are presented in Table 4. The results demonstrate that all concentrations are well below the ambient air quality standards for each case. In general, the existing case indicated the highest concentrations, while the future year no-build and build cases are very similar.

Table 4: Maximum CO Concentrations at Busiest Roadway Sections

Roadway Section	Existing 1-Hour (ppm)	Existing 8-Hour (ppm)	2030 No-Build 1-Hour (ppm)	2030 No-Build 8-Hour (ppm)	2030 Build Baseline 1-Hour (ppm)	2030 Build Baseline 8-Hour (ppm)	2030 LPA Build 1-Hour (ppm)	2030 LPA Build 8-Hour (ppm)
Revere Beach Parkway	8.0	5.1	7.5	4.8	7.5	4.8	7.5	4.8
McGrath Highway	7.0	4.4	6.4	4.0	6.4	4.0	6.4	4.0
Melnea Cass Boulevard, southeast of Tremont Street	6.5	4.1	6.4	4.0	6.5	4.1	6.4	4.0
Melnea Cass Boulevard, west of Mass Avenue	6.9	4.3	6.5	4.1	6.5	4.1	6.5	4.1
Morrissey Boulevard	7.4	4.7	7.0	4.4	7.0	4.4	7.0	4.4
Fellsway	7.5	4.8	7.5	4.8	7.6	4.8	7.6	4.8
NAAQS/MAAQS	35.0	9.0	35.0	9.0	35.0	9.0	35.0	9.0

2.7 Modeling of the Six Busiest Bus Stations

Modeling was also conducted to evaluate CO concentrations within the area of the six busiest bus stations in the project area. Consistent with the previous analyses, the modeling used the EPA MOBILE6.2.03[3] and CAL3QHC[4] models. Contributions from buses and cars, both free flow and queuing (i.e., queuing of buses loading or unloading and cars waiting to pickup individuals) were evaluated in the modeling, along with adjacent roadways and parking lots at stations with parking. In addition, the background concentrations of 5.0 ppm (one-hour) and 3.0 ppm (eight-hour) were included.

Based on the results of the intersection and roadway analyses, which demonstrated little difference between the build alternatives, only the LPA (preferred alternative) was analyzed. The six stations modeled are as follows:

- Wellington Station
- Sullivan Square Station
- Kenmore Square Station

- Kendall Square Station
- Ruggles Station
- JFK/UMass Station

For both the Kenmore Square and Ruggles Stations, which have a significant canopy overhead, an additional contribution was calculated for CO emitted from buses below these canopies. These areas were conservatively assumed to be naturally ventilated by a very light wind of 0.5 meters per second.

Results of the modeling in Table 5 demonstrate that all CO concentrations around these six stations are well below the ambient air quality standards. Similar to the other analyses, the existing case indicated the highest concentrations, while the future year no-build and build cases are lower primarily due to mandatory future year emission reductions. Further, in almost all cases, build and no-build concentrations are the same. In the few cases that this is not so, build concentrations only increase by 0.1 ppm.

Table 5: Maximum CO Concentrations at Bus Stations

Bus Station	Existing 1-Hour (ppm)	Existing 8-Hour (ppm)	2030 No-Build 1-Hour (ppm)	2030 No-Build 8-Hour (ppm)	2030 LPA 1-Hour (ppm)	2030 LPA 8-Hour (ppm)
Wellington	7.0	4.4	6.5	4.1	6.5	4.1
Sullivan	10.3	6.7	9.1	5.9	9.1	5.9
Kenmore Square	6.3	4.0	5.8	3.6	5.8	3.6
Kendall Square	5.6	3.4	5.2	3.1	5.3	3.2
Ruggles	5.6	3.4	5.1	3.1	5.2	3.1
JFK/U Mass	7.7	4.9	7.1	4.5	7.1	4.5
NAAQS/MAAQS	35.0	9.0	35.0	9.0	35.0	9.0

3 Mesoscale Analysis

The mesoscale analysis was developed in cooperation with CTPS and the project's traffic engineers. DEP's Guidelines for Performing Mesoscale Analysis of Indirect Sources,[6] require that the mesoscale study area be defined to include at least all roadways within the traffic study area at LOS D or worse, and where traffic increases due to the project are 10% or greater. Based on these criteria and the regional extent of the project, CTPS utilized comprehensive traffic data to reflect each of the cities and towns impacted by the project, as well as the Boston MPO. For each city and town in the project area and Boston MPO, calculations were performed using CTPS' regional model on a link by link basis by assigned volume, congested speed, and functional class for all significant roadways in eastern Massachusetts. The EPA MOBILE6.2.03 computer program was used by CTPS to estimate VOC, NOx, CO, CO_2, PM2.5, and PM10 emission factors from motor vehicles on roadways. These emission factors were based on typical motor vehicle operations as provided by the USEPA and Massachusetts DEP. Further, representative summertime VOC and NOx emission factors were used as high ozone episodes are generally associated with warmer times of the year. Total pollutant emissions were calculated for the CTPS base case (2000), as well the 2030 no-build case, 2030 baseline build case and 2030 LPA (preferred alternative) case .

Total emissions from motor vehicles in project impacted cities/towns and the Boston MPO were determined from those vehicles operating on the study area roadways. Individual roadway emissions were determined by roadway link using vehicle miles traveled (VMT) and emission factors from the EPA MOBILE6.2.03 model. Average daily traffic volumes (ADT) for each roadway link in the regional study area were provided by CTPS and are consistent with the traffic component of this study. The ADT and length of each roadway link provides vehicle miles traveled (VMT). Emissions from all roadways in the project areas were calculated by summing emissions from individual roadway links.

3.1 Motor Vehicle Emissions

The EPA MOBILE6.2.03 model was used to estimate vehicle emissions based on electronic input data files provided by the Massachusetts DEP. These input files assume the following:

- Massachusetts specific Registration Distribution, by vehicle age, for all study years (2005_REG.D)
- Massachusetts specific Inspection/Maintenance Program and Cutpoints
- Anti-tampering program

- Start Year: 2000
- First Model Year: 1984
- Last Model Year: 2050
- Vehicle Types Not Subject to Inspection: LDGV, LDGT1, LDGT2, LDGT3, LDGT4, and HDGV2B
- Vehicle Types Subject to Inspection: HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B, and Gasoline Buses
- Inspection Frequency: Biennial
- Compliance Rate: 96%
- Inspections Performed: All Except Tailpipe Lead Deposit, Fuel Inlet Restrictor & Evaporative System Tests

- Stage II program:

- Start Year: 1991
- Phase In Period: 3 Years
- 84% System Efficiency for Refueling Emissions for LDGVs and LDGTs
- 84% System Efficiency for Refueling Emissions from HDGVs

- Massachusetts specific phase-in fractions for Tier 2 exhaust and evaporative emission standards, and Massachusetts specific Tier 2 50,000 mile (50K) certification standards (LEV2EXH.D, LEV2EVAP.D, and LEV2CERT.D).

- Massachusetts specific 1994 and later fleet penetration fractions for light duty gasoline vehicles under the LEV emissions standard program (MA_LEV2.D)

- Diesel rebuild effects: 0.10

- Minimum and maximum daily temperatures of 68°F and 94°F for summer

- Absolute humidity: 75 grains/lb

- Fuel RVP of 6.8 psi for summer

- Reformulated gasoline program for northern region

- Sulfur content of gasoline: 30 ppm (2000 and 2030)

- Sulfur content of diesel: 350 ppm (2000) and 15 ppm (2030)

- Low altitude region

- July 1st emission rates for summer

- One average speed per roadway link - all vehicle types (using AVERAGE SPEED option with 100% arterials)

MOBILE6.2.03 model output is included at the end of this report.

3.2 Mesoscale Model Results

Results of the mesoscale analysis are presented in Tables 6 and 7. These tables present VOC, NOx, CO, CO_2, PM2.5 and PM10 emissions for the existing year and future year cases.

Table 6: Existing Mesoscale Area Emissions – Year 2000

Pollutant	Area Represented	Existing Emissions (lbs/day)
VOC	MPO	29,530
	Project Impacted Cities/Towns	6,683
NOx	MPO	24,864
	Project Impacted Cities/Towns	4,895
CO	MPO	1,382,467
	Project Impacted Cities/Towns	265,469
CO_2	MPO	91,136,512
	Project Impacted Cities/Towns	17,322,181
PM2.5	MPO	2,041
	Project Impacted Cities/Towns	389
PM10	MPO	4,394
	Project Impacted Cities/Towns	837

Table 7: Future Mesoscale Area Emissions by Alternative – Year 2030

Pollutant	Area Represented	No-Build Emissions (lbs/day)	Baseline Build Emissions (lbs/day)	LPA Build Emissions (lbs/day)
VOC	MPO	33,647	33,577	33,528
	Project Impacted Cities/Towns	7,930	7,881	7,844
NOx	MPO	27,447	27,407	27,377
	Project Impacted Cities/Towns	5,279	5,251	5,229
CO	MPO	1,527,885	1,525,820	1,524,281
	Project Impacted Cities/Towns	287,965	286,549	285,444
CO_2	MPO	100,337,252	100,209,711	100,111,457
	Project Impacted Cities/Towns	18,401,844	18,316,913	18,249,444
PM2.5	MPO	2,246	2,244	2,241
	Project Impacted Cities/Towns	413	412	410
PM10	MPO	4,837	4,831	4,826
	Project Impacted Cities/Towns	889	884	881

The results demonstrate that for all future year cases the LPA exhibits the lowest emissions while the no-build case has the highest emissions. Both the LPA and baseline build cases have lower emissions, than the no-build case, as a result of increased public transportation that reduces the number of individual motor vehicles on project area roadways.

REFERENCES

1. Personal Communication, Ms. Christine Kirby and Mr. Keith Grillo, Massachusetts Department of Environmental Protection, 5/8/2007 and 6/28/2007.

2. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, EPA-454/R-92-005, November, 1992.

3. USEPA, User's Guide to MOBILE6.1 and MOBILE6.2 (Mobile Source Emission Factor Model), August, 2003, EPA420-R-03-010.

4. EPA, *User's Guide to CAL3QHC, Version 2.0: A Modeling Methodology For Predicting Pollutant Concentrations Near Roadway Intersections*, EPA-454/R-92-006, Revised, September, 1995.

5. Benson, P., *CALINE3 - A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets*, FHWA/CA/TL-79/23, November, 1979.

6. MADEP, *Guidelines for Performing Mesoscale Analysis of Indirect Sources*, May, 1991.

ADDITIONAL SUPPORTING MATERIALS

MOBILE6.2.03 Microscale Analysis

MOBILE6.2.03 Mesoscale Analysis

April 12, 2007 Memo on Ultrafine Particulates

Air Quality Modeling Protocol

MOBILE6.2.03 Microscale Analysis

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)
* Input file: MA06_MIC.INP (file 1, run 1).                            *
************************************************************************
* *** Winter 2006 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:   0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:    1.00      MYR sum not = 1. (will normalize)
                   1.00      MYR sum not = 1. (will normalize)
* Reading I/M program description records from the following external
* data file: MA_IM06.D
* I/M program inputs for 2006 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA06_CUT.D
```

```
**************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                             *
* Input file: MA06_MIC.INP (file 1, run 1).                              *
**************************************************************************
* *** Winter 2006 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
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                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA_IM06.D
* I/M program inputs for 2006 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA06_CUT.D
```


MOBILE 6.2 Mesoscale Analysis

```
 * Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
 * OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
 * Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
 * Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
 * OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
 * OBD Evap I/M program for MY 2004+
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                User has enabled STAGE II REFUELING.


 * Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
 * data file: MA_LEV2.D

   Reading User Supplied Tier2 Exhaust bin phase-in fractions

      Data read from file: LEV2EXH.D


   Reading User Supplied Tier2 EVAP phase-in fractions

      Data read from file: LEV2EVAP.D


   Reading User Supplied Tier2 50K certification standards

      Data read from file: LEV2CERT.D

   M616 Comment:
                User has supplied post-1999 sulfur levels.
   M614 Comment:
                User supplied diesel sale fractions.

 * # # # # # # # # # # # # # # # # # # # # # # # # # # #
 * 2006 DEFAULT SPEED - Winter

 * File 1, Run 1, Scenario 1.
 * # # # # # # # # # # # # # # # # # # # # # # # # # # #
   M112 Warning:
                Wintertime Reformulated Gasoline Rules Apply
 *** I/M credits for Tech1&2 vehicles were read from the following external
     data file: TECH12.D
   M 48 Warning:
               there are no sales for vehicle class HDGV8b
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.
```

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2006
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.25	13.98	15.28	14.35	9.52	1.597	1.007	2.793	15.79	12.730

* #
* 2006 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 2.
* #

M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2006
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	29.18	29.17	34.90	30.79	44.15	4.431	3.047	12.385	100.99	29.277

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 3.
* #
M583 Warning:
The user supplied arterial average speed of 5.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2006
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	19.15	19.80	22.76	20.63	35.27	3.759	2.563	10.110	60.45	19.795

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 4.
* #
M583 Warning:
The user supplied arterial average speed of 10.0
will be used for all hours of the day. 100% of VMT

has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2006
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	14.66	15.44	17.18	15.93	23.47	2.831	1.896	6.971	31.83	14.968

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 5.
* #
M583 Warning:

The user supplied arterial average speed of 15.0 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2006
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.41	14.15	15.57	14.55	16.50	2.258	1.483	5.031	22.56	13.360

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 6.

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                      Calendar Year:  2006
                              Month:  Jan.
                           Altitude:  Low
                 Minimum Temperature:  35.0 (F)
                 Maximum Temperature:  45.0 (F)
                   Absolute Humidity:   75. grains/lb
                 Fuel Sulfur Content:   30. ppm

                 Exhaust I/M Program:  Yes
                    Evap I/M Program:  Yes
                         ATP Program:  Yes
                   Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	12.78	13.50	14.76	13.86	12.25	1.895	1.221	3.799	18.29	12.507

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter
```

```
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                      Calendar Year:  2006
                              Month:  Jan.
                           Altitude:  Low
                 Minimum Temperature:  35.0 (F)
                 Maximum Temperature:  45.0 (F)
                   Absolute Humidity:   75. grains/lb
                 Fuel Sulfur Content:   30. ppm

                 Exhaust I/M Program:  Yes
                    Evap I/M Program:  Yes
                         ATP Program:  Yes
                    Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	12.45	13.16	14.34	13.49	9.61	1.659	1.052	3.003	15.67	12.028

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2006
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	12.33	13.04	14.18	13.36	7.97	1.506	0.941	2.484	13.78	11.805

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2006
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000

```
 Composite Emission Factors (g/mi):
```

Composite CO :	12.41	13.12	14.29	13.45	6.98	1.407	0.870	2.150	12.37	11.810

```
--------------------------------------------------------------------------------------------------------------------------------
----

* # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 40.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                      Calendar Year:  2006
                              Month:  Jan.
                           Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes

        Vehicle Type:      LDGV     LDGT12     LDGT34      LDGT       HDGV       LDDV       LDDT       HDDV         MC    All Veh
                     GVWR:            <6000      >6000     (All)
                          ------     ------     ------     ------     ------     ------     ------     ------     ------     ------
     VMT Distribution:    0.3867     0.3484     0.1367                0.0358     0.0010     0.0015     0.0860     0.0040     1.0000

--------------------------------------------------------------------------------------------------------------------------------
----
 Composite Emission Factors (g/mi):
```

Composite CO :	12.79	13.54	14.79	13.89	6.46	1.348	0.827	1.948	11.40

12.131

---

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 11.
* #
M583 Warning:
The user supplied arterial average speed of 45.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2006
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000

```
----
 Composite Emission Factors (g/mi):
     Composite CO  :      13.18      13.95      15.29      14.32       6.32      1.318      0.806      1.847      10.78
12.475

------------------------------------------------------------------------------------------------------------------------
----

* # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 50.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                      Calendar Year:  2006
                              Month:  Jan.
                           Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes

       Vehicle Type:       LDGV     LDGT12     LDGT34       LDGT       HDGV       LDDV       LDDT       HDDV         MC
All Veh
                GVWR:                <6000      >6000      (All)
                       ------     ------     ------     ------     ------     ------     ------     ------     ------
------
   VMT Distribution:     0.3867     0.3484     0.1367                0.0358     0.0010     0.0015     0.0860     0.0040
1.0000
```

Composite Emission Factors (g/mi):

Composite CO :	13.57	14.36	15.78	14.76	6.52	1.314	0.803	1.833	10.53
12.841									

---

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 13.
* #

M583 Warning:
The user supplied arterial average speed of 55.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2006
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------

```
   VMT Distribution:     0.3867     0.3484     0.1367     0.0358     0.0010     0.0015     0.0860     0.0040
1.0000

-------------------------------------------------------------------------------------------------------------
----
 Composite Emission Factors (g/mi):
     Composite CO  :      13.95      14.77      16.28      15.20       7.12      1.335      0.818      1.903      10.53
13.230

-------------------------------------------------------------------------------------------------------------
----

* # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 60.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2006
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:  35.0 (F)
              Maximum Temperature:  45.0 (F)
                Absolute Humidity:   75. grains/lb
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  Yes
                 Evap I/M Program:  Yes
                      ATP Program:  Yes
                Reformulated Gas:  Yes

       Vehicle Type:       LDGV     LDGT12     LDGT34       LDGT        HDGV       LDDV       LDDT       HDDV         MC
All Veh
              GVWR:                  <6000      >6000      (All)
```

VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040
1.0000									

Composite Emission Factors (g/mi):

Composite CO :	14.34	15.18	16.78	15.63	8.21	1.383	0.853	2.068	16.75
13.669									

* #
* 2006 Scenario - Winter

* File 1, Run 1, Scenario 15.
* #
M583 Warning:
The user supplied arterial average speed of 65.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2006
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC

All Veh

GVWR:		<6000	>6000	(All)					
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040
1.0000									

Composite Emission Factors (g/mi):

Composite CO :	14.73	15.59	17.28	16.07	10.01	1.467	0.913	2.353	22.96
14.144									

```
* Calendar Year 2006 Generic MOBILE6 input file for Microscale Build/No-Build Analyses
* Filename MA05_MES.INP created on 10/7/05 by Craig Woleader, MADEP 617-348-4046, craig.woleader@state.ma.us
* revised 12/2/05 to include actual diesel rebuild effects
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA06_MIC.tbl REPLACE
REPORT FILE         : MA06_MIC.txt REPLACE
*
RUN DATA

***************     Run Section #2     ***************
> *** Winter 2006 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA_IM06.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D
```

* Meteorological inputs
MIN/MAX TEMP : 35. 45.

* Fuel inputs
FUEL RVP : 13.5
FUEL PROGRAM : 2 N

DIESEL FRACTIONS :

0.000	0.000	0.000	0.003	0.003	0.002	0.002	0.002	0.002	0.001
0.001	0.001	0.000	0.001	0.001	0.003	0.001	0.002	0.000	0.015
0.009	0.056	0.070	0.119	0.136					
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001
0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.006
0.013	0.017	0.019	0.020	0.064					
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001
0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.006
0.013	0.017	0.019	0.020	0.064					
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.012
0.012	0.017	0.015	0.014	0.016	0.017	0.014	0.018	0.016	0.021
0.048	0.065	0.060	0.066	0.101					
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.012
0.012	0.017	0.015	0.014	0.016	0.017	0.014	0.018	0.016	0.021
0.048	0.065	0.060	0.066	0.101					
0.176	0.176	0.176	0.170	0.207	0.202	0.206	0.243	0.176	0.285
0.267	0.212	0.255	0.295	0.249	0.251	0.188	0.175	0.182	0.186
0.219	0.184	0.170	0.143	0.140					
0.385	0.385	0.385	0.407	0.433	0.467	0.464	0.480	0.375	0.472
0.480	0.366	0.400	0.344	0.285	0.333	0.314	0.253	0.208	0.197
0.168	0.130	0.106	0.114	0.087					
0.674	0.674	0.674	0.634	0.664	0.719	0.717	0.744	0.715	0.565
0.810	0.803	0.644	0.654	0.605	0.525	0.389	0.356	0.376	0.108
0.136	0.154	0.148	0.120	0.000					
0.830	0.830	0.830	0.845	0.860	0.840	0.819	0.813	0.610	0.686
0.570	0.733	0.607	0.729	0.685	0.725	0.631	0.350	0.305	0.186
0.209	0.343	0.091	0.175	0.200					
0.884	0.884	0.884	0.840	0.887	0.931	0.917	0.914	0.923	0.901
0.908	0.898	0.903	0.876	0.804	0.844	0.782	0.702	0.679	0.554
0.529	0.568	0.628	0.571	0.583					
0.977	0.977	0.977	0.972	0.953	0.993	0.992	0.992	0.990	0.981

```
0.976   0.975   0.959   0.982   0.965   0.963   0.945   0.902   0.875   0.857
0.791   0.796   0.846   0.805   0.879
0.972   0.972   0.972   0.955   0.984   0.995   0.992   0.991   0.995   0.993
0.993   0.995   0.992   0.986   0.995   0.981   0.993   0.971   0.982   0.977
0.993   0.987   0.986   0.988   0.967
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.917   0.884   0.925   0.968   0.961   0.972   0.985
0.971   0.941   0.905   0.965   0.940   0.907   0.964   0.609   0.880   1.000
0.778   0.500   1.000   0.000   0.000

***************     Scenario Section     ***************

SCENARIO RECORD     : 2006 DEFAULT SPEED - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1

SCENARIO RECORD     : 2006 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
```

```
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
```

```
EVALUATION MONTH    : 1
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************      End of This Run      ***************
END OF RUN
```

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA30_MIC.INP (file 1, run 1).                            *
************************************************************************
* *** Winter 2030 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA30_IM.D
* I/M program inputs for 2030 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA30_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
```

```
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
  M601 Comment:
               User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* 2030 DEFAULT SPEED - Winter

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M112 Warning:
               Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDV
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D

                    Calendar Year:  2030
                            Month:  Jan.
                         Altitude:  Low
```

Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	9.12	8.23	8.15	8.20	7.35	0.000	0.288	0.237	15.79	7.743

* #
* 2030 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 2.
* #
M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year: 2030
Month: Jan.

```
                    Altitude:  Low
          Minimum Temperature:  35.0 (F)
          Maximum Temperature:  45.0 (F)
            Absolute Humidity:   75. grains/lb
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  Yes
             Evap I/M Program:  Yes
                 ATP Program:  Yes
            Reformulated Gas:  Yes

       Vehicle Type:      LDGV      LDGT12     LDGT34      LDGT       HDGV       LDDV       LDDT       HDDV
MC   All Veh
                GVWR:                <6000      >6000      (All)
                      ------     ------     ------     ------     ------     ------     ------     ------
------    ------
   VMT Distribution:    0.2610     0.4386     0.1723                0.0371     0.0000     0.0015     0.0858
0.0036    1.0000

-------------------------------------------------------------------------------------------------------------
----------
 Composite Emission Factors (g/mi):
     Composite CO  :      17.19      16.22      16.61      16.33      34.07      0.000      0.992      1.051
100.99    16.180

-------------------------------------------------------------------------------------------------------------
----------

* # # # # # # # # # # # # # # # # # # # # # # # #
* 2030 Winter

* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  5.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDV

 LEV phase-in data read from file MA_LEV2.D

                  Calendar Year:  2030
```

```
                    Month:  Jan.
                 Altitude:  Low
Minimum Temperature:  35.0 (F)
Maximum Temperature:  45.0 (F)
  Absolute Humidity:   75. grains/lb
Fuel Sulfur Content:   30. ppm

Exhaust I/M Program:  Yes
   Evap I/M Program:  Yes
        ATP Program:  Yes
  Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	12.17	11.31	11.41	11.34	27.22	0.000	0.825	0.858	60.45	11.406

```
* # # # # # # # # # # # # # # # # # # # # # # #
* 2030 Winter

* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D
```

```
                    Calendar Year:  2030
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                  Reformulated Gas:  Yes

       Vehicle Type:      LDGV     LDGT12     LDGT34      LDGT       HDGV       LDDV       LDDT       HDDV
MC    All Veh
                GVWR:                <6000      >6000     (All)
                      ------     ------     ------     ------     ------     ------     ------     ------
------    ------
   VMT Distribution:    0.2610     0.4386     0.1723                0.0371     0.0000     0.0015     0.0858
0.0036    1.0000

-------------------------------------------------------------------------------------------------------------
----------
 Composite Emission Factors (g/mi):
     Composite CO  :      9.84       8.97       8.94       8.96      18.11      0.000      0.594      0.592
31.83     8.882

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* # # # # # # # # # # # # # # # # # # # # # # # #
* 2030 Winter

* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D
```

```
                    Calendar Year:  2030
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes

        Vehicle Type:       LDGV     LDGT12     LDGT34      LDGT       HDGV       LDDV       LDDT       HDDV
MC    All Veh
                  GVWR:                <6000      >6000      (All)
                         ------     ------     ------     ------     ------     ------     ------     ------
------    ------
   VMT Distribution:      0.2610     0.4386     0.1723                0.0371     0.0000     0.0015     0.0858
0.0036    1.0000

--------------------------------------------------------------------------------------------------------------
----------
 Composite Emission Factors (g/mi):
     Composite CO  :        9.16       8.25       8.17       8.23      12.73      0.000      0.452      0.427
22.56     8.006

--------------------------------------------------------------------------------------------------------------
----------

* # # # # # # # # # # # # # # # # # # # # # # # #
* 2030 Winter

* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDV
```

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	8.81	7.89	7.79	7.86	9.45	0.000	0.362	0.322	18.29	7.545

* #
* 2030 Winter

* File 1, Run 1, Scenario 7.
* #
M583 Warning:
The user supplied arterial average speed of 25.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	8.61	7.68	7.58	7.65	7.42	0.000	0.303	0.255	15.67	7.277

* #
* 2030 Winter

* File 1, Run 1, Scenario 8.
* #
M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:

there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	8.56	7.63	7.52	7.60	6.15	0.000	0.265	0.211	13.78	7.170

* #
* 2030 Winter

* File 1, Run 1, Scenario 9.
* #

M583 Warning:
The user supplied arterial average speed of 35.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	8.59	7.67	7.56	7.64	5.39	0.000	0.241	0.182	12.37	7.172

* #
* 2030 Winter

* File 1, Run 1, Scenario 10.
* #
M583 Warning:
The user supplied arterial average speed of 40.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:

there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

MC	Vehicle Type: All Veh	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV
	GVWR:		<6000	>6000	(All)				
	VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858
0.0036	1.0000								
	Composite Emission Factors (g/mi):								
	Composite CO :	8.83	7.93	7.84	7.91	4.99	0.000	0.226	0.165
11.40	7.376								

* #
* 2030 Winter

* File 1, Run 1, Scenario 11.
* #
M583 Warning:
The user supplied arterial average speed of 45.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

MC	Vehicle Type: All Veh	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV
	GVWR:		<6000	>6000	(All)				
	VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858
0.0036	1.0000								
	Composite Emission Factors (g/mi):								
	Composite CO :	9.07	8.19	8.11	8.17	4.87	0.000	0.219	0.157
10.78	7.593								

* #
* 2030 Winter

* File 1, Run 1, Scenario 12.
* #
M583 Warning:
The user supplied arterial average speed of 50.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:

Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	9.31	8.46	8.38	8.44	5.04	0.000	0.218	0.156	10.53	7.822

* #
* 2030 Winter

* File 1, Run 1, Scenario 13.
* #
M583 Warning:
The user supplied arterial average speed of 55.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000

Composite Emission Factors (g/mi):

Composite CO :	9.55	8.72	8.65	8.70	5.50	0.000	0.223	0.162	10.53	8.064

* #
* 2030 Winter

* File 1, Run 1, Scenario 14.
* #
M583 Warning:
The user supplied arterial average speed of 60.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway

type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	9.79	8.98	8.92	8.96	6.34	0.000	0.235	0.176	16.75	8.343

* #
* 2030 Winter

* File 1, Run 1, Scenario 15.
* #
M583 Warning:
The user supplied arterial average speed of 65.0
will be used for all hours of the day. 100% of VMT

has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2030
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	10.03	9.24	9.20	9.23	7.72	0.000	0.256	0.200	22.96	8.643

```
* Calendar Year 2030 Generic MOBILE6 input file for Microscale Build/No-Build Analyses
* Filename MA30_MIC.INP 'created on 12/9/05 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA30_MIC.tb1 REPLACE
REPORT FILE         : MA30_MIC.txt REPLACE
*
RUN DATA
***************     Run Section #2     ***************
> *** Winter 2030 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA30_IM.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D
```

```
* Meteorological inputs
MIN/MAX TEMP        : 35. 45.

* Fuel inputs
FUEL RVP            : 13.5
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
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0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
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```

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0.977 0.977 0.977 0.977 0.977
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786
```

```
***************     Scenario Section     ***************

SCENARIO RECORD     : 2030 DEFAULT SPEED - Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1

SCENARIO RECORD     : 2030 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
```

```
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
```

```
EVALUATION MONTH    : 1
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************      End of This Run      ***************
END OF RUN
```

2030 Idle.


```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA30IDLE.INP (file 1, run 1).                            *
************************************************************************
* *** Winter 2030 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA30_IM.D
* I/M program inputs for 2030 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA30_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
```

```
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
  M601 Comment:
               User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* 2030 DEFAULT SPEED - Winter

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M112 Warning:
               Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDV
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D

                   Calendar Year:  2030
                           Month:  Jan.
                        Altitude:  Low
```

Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	All Veh	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV
GVWR:			<6000	>6000	(All)				
VMT Distribution:	1.0000	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858
Composite Emission Factors (g/mi):									
Composite CO :	7.743	9.12	8.23	8.15	8.20	7.35	0.000	0.288	0.237
Exhaust emissions (g/mi):									
CO Start:	5.371	6.01	4.90	4.63	4.82		0.000	0.083	
CO Running:	10.416	3.11	3.33	3.51	3.38		0.000	0.205	
CO Total Exhaust:	7.743	9.12	8.23	8.15	8.20	7.35	0.000	0.288	0.237

* #
* 2030 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 2.
* #
M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDV

LEV phase-in data read from file MA_LEV2.D

Calendar Year: 2030
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2610	0.4386	0.1723		0.0371	0.0000	0.0015	0.0858	0.0036	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	17.19	16.22	16.61	16.33	34.07	0.000	0.992	1.051	100.99	16.180
Exhaust emissions (g/mi):										
CO Start:	6.01	4.90	4.63	4.82		0.000	0.083		5.371	
CO Running:	11.18	11.33	11.97	11.51		0.000	0.908		95.617	
CO Total Exhaust:	17.19	16.22	16.61	16.33	34.07	0.000	0.992	1.051	100.99	16.180

2006 Idle


```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA06IDLE.INP (file 1, run 1).                            *
************************************************************************
* *** Winter 2006 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                 1.00      MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA_IM06.D
* I/M program inputs for 2006 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA06_CUT.D
```

```
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
  M601 Comment:
                User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
                User has supplied post-1999 sulfur levels.
  M614 Comment:
                User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 DEFAULT SPEED - Winter

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M112 Warning:
                Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.
```

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2006
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.25	13.98	15.28	14.35	9.52	1.597	1.007	2.793	15.79	12.730
Exhaust emissions (g/mi):										
CO Start:	7.58	8.07	7.84	8.00		0.772	0.413		5.371	
CO Running:	5.67	5.92	7.44	6.35		0.825	0.594		10.416	
CO Total Exhaust:	13.25	13.98	15.28	14.35	9.52	1.597	1.007	2.793	15.79	12.730

* #
* 2006 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

```
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2006
                            Month:  Jan.
                         Altitude:  Low
               Minimum Temperature:  35.0 (F)
               Maximum Temperature:  45.0 (F)
                 Absolute Humidity:   75. grains/lb
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  Yes
                  Evap I/M Program:  Yes
                       ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3867	0.3484	0.1367		0.0358	0.0010	0.0015	0.0860	0.0040	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	29.18	29.17	34.90	30.79	44.15	4.431	3.047	12.385	100.99	29.277

Exhaust emissions (g/mi):

	0.74	0.73	0.78	0.74		0.83	0.86		0.95
CO Start:	7.58	8.07	7.84	8.00		0.772	0.413		5.371
CO Running:	21.60	21.11	27.06	22.79		3.658	2.634		95.617
CO Total Exhaust:	29.18	29.17	34.90	30.79	44.15	4.431	3.047	12.385	100.99

29.277

IDLE MODE FACTORS

VEH TYPE	2030 Fraction	2030 Total Emissions	2030 Total Composite	2030 Running Emissions	2030 Running Composite
LDGV	0.2610	17.19	4.48659	11.18	2.91798
LDGT12	0.4386	16.22	7.114092	11.33	4.969338
LDGT34	0.1723	16.61	2.861903	11.97	2.062431
HDGV	0.0371	34.07	1.263997	34.07	1.263997
LDDV	0.0000	0	0	0	0
LDDT	0.0015	0.992	0.001488	0.908	0.001362
HDDV	0.0858	1.051	0.0901758	1.051	0.0901758
MC	0.0036	100.99	0.363564	95.617	0.3442212
Total	0.9999		16.182		11.650

g/mi x 2.5 mi/hr

= 29.125 gm/hr

VEH TYPE	2006 Fraction	2006 Emissions	2006 Composite	2006 Emissions	2006 Composite
LDGV	0.3867	29.18	11.283906	21.6	8.35272
LDGT12	0.3484	29.17	10.162828	21.11	7.354724
LDGT34	0.1367	34.9	4.77083	27.06	3.699102
HDGV	0.0358	44.15	1.58057	44.15	1.58057
LDDV	0.0010	4.431	0.004431	3.658	0.003658
LDDT	0.0015	3.047	0.0045705	2.634	0.003951
HDDV	0.0860	12.385	1.06511	12.385	1.06511
MC	0.0040	100.99	0.40396	95.617	0.382468
Total	1.0001		29.276		22.442

g/mi x 2.5 mi/hr

= 56.105 gm/hr

MOBILE6.2.03 Mesoscale Analysis

2000 sum	CO-W	NOx	VOC	CO2	PM2.5
EMass	934,689	16,821	19,410	61,406,251	1,375
MPO	627,087	11,278	13,395	41,339,522	926
Boston	78,724	1,451	2,040	5,097,865	115
Brookline	6,298	117	157	424,928	10
Cambridge	9,218	175	240	609,865	14
Chelsea	3,844	69	87	254,338	6
Everett	2,811	53	72	188,245	4
Malden	4,126	76	100	278,589	6
Medford	12,713	229	274	835,837	19
Quincy	15,070	268	333	1,013,125	23
Revere	7,964	143	176	529,523	12
Somerville	6,809	126	161	446,264	10
Waltham	12,305	218	253	819,370	18

7 Communities
lbs/day

2000 sum	CO-W	NOx	VOC	CO2	PM2.5
2000	265,469	4,895	6,683	17,322,181	389
MPO	1,382,467	24,864	29,530	91,136,512	2,041

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
2,960	107,801,537	3,353,863	331,420,135	682,291,453	0.49	32.14
1,993	72,558,447	2,414,475	252,619,469	493,005,820	0.51	30.05
246	8,907,980	471,993	58,675,540	123,291,840	0.48	18.87
21	746,106	33,813	4,423,764	10,548,441	0.42	22.07
30	1,071,176	54,562	9,501,164	20,869,792	0.46	19.63
12	446,723	16,821	3,325,494	5,390,704	0.62	26.56
9	330,638	16,148	2,379,705	4,045,118	0.59	20.48
13	489,322	21,058	3,102,482	9,488,871	0.33	23.24
40	1,467,983	50,530	6,784,755	12,219,495	0.56	29.05
49	1,779,395	62,308	6,555,782	10,521,373	0.62	28.56
26	930,013	33,289	4,929,857	9,165,264	0.54	27.94
22	783,829	33,641	5,586,362	8,557,522	0.65	23.30
40	1,439,077	42,654	5,023,321	6,992,195	0.72	33.74

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
837						
4,394						

2030 NB sum	CO-W	NOx	VOC	CO2	PM2.5
EMass	1,092,971	19,618	23,361	71,798,786	1,607
MPO	693,048	12,450	15,262	45,512,978	1,019
Boston	89,324	1,635	2,614	5,607,732	126
Brookline	5,992	111	150	404,222	9
Cambridge	8,830	167	226	586,490	13
Chelsea	3,315	61	78	218,485	5
Everett	2,977	56	78	196,971	4
Malden	4,023	74	96	271,103	6
Medford	12,910	231	280	853,592	19
Quincy	15,891	286	360	1,058,789	24
Revere	8,317	149	186	552,877	12
Somerville	7,274	134	172	479,585	11
Waltham	12,299	217	254	821,328	18

7 Communities lbs/day	CO-W	NOx	VOC	CO2	PM2.5
2030NB	287,965	5,279	7,930	18,401,844	413
MPO	1,527,885	27,447	33,647	100,337,252	2,246

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
3,460	125,866,302	4,223,692	368,161,752	696,882,014	0.53	29.80
2,194	79,707,228	2,880,459	267,952,178	506,517,820	0.53	27.67
271	9,625,023	672,980	61,201,085	130,531,363	0.47	14.30
20	709,714	32,124	4,226,454	10,548,441	0.40	22.09
28	1,030,223	50,443	9,046,668	21,137,349	0.43	20.42
11	383,670	15,920	2,920,266	5,390,704	0.54	24.10
10	345,963	17,747	2,482,855	4,062,918	0.61	19.49
13	476,178	19,691	2,956,807	9,634,608	0.31	24.18
41	1,499,159	51,826	6,771,658	12,237,295	0.55	28.93
51	1,859,582	70,254	6,896,042	10,653,203	0.65	26.47
27	970,894	35,631	4,880,071	9,794,383	0.50	27.25
23	842,357	35,690	5,860,987	8,615,372	0.68	23.60
40	1,442,519	43,085	4,967,173	6,992,195	0.71	33.48

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
889						
4,837						

2030 Base sum	CO-W	NOx	VOC	CO2	PM2.5
EMass	1,091,966	19,599	23,327	71,736,340	1,605
MPO	692,112	12,432	15,231	45,455,125	1,018
Boston	88,801	1,624	2,595	5,577,183	125
Brookline	5,978	111	150	403,135	9
Cambridge	8,798	166	225	584,379	13
Chelsea	3,296	60	78	217,157	5
Everett	2,959	56	77	195,845	4
Malden	4,012	74	96	270,452	6
Medford	12,900	231	279	852,984	19
Quincy	15,881	285	360	1,058,488	24
Revere	8,289	149	186	551,058	12
Somerville	7,247	134	171	477,869	11
Waltham	12,290	217	254	820,664	18

7 Communities lbs/day	CO-W	NOx	VOC	CO2	PM2.5
2030 Baseline	286,549	5,251	7,881	18,316,913	412
MPO	1,525,820	27,407	33,577	100,209,711	2,244

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
3,457	125,757,353	4,212,617	367,525,645	696,882,014	0.53	29.85
2,191	79,606,657	2,869,789	267,327,109	506,517,820	0.53	27.74
269	9,572,210	665,825	60,812,071	130,531,363	0.47	14.38
19	707,795	32,130	4,214,903	10,548,441	0.40	22.03
28	1,026,514	50,202	9,005,820	21,137,349	0.43	20.45
10	381,253	15,851	2,902,266	5,390,704	0.54	24.05
9	343,988	17,611	2,471,738	4,062,918	0.61	19.53
13	475,038	19,604	2,948,322	9,634,608	0.31	24.23
41	1,498,096	51,605	6,760,055	12,237,295	0.55	29.03
51	1,859,050	70,067	6,888,490	10,653,203	0.65	26.53
27	967,751	35,434	4,863,984	9,794,383	0.50	27.31
23	839,347	35,496	5,836,588	8,615,372	0.68	23.65
40	1,441,353	43,003	4,964,393	6,992,195	0.71	33.52

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
884						
4,831						

2030 LPA1 sum	CO-W	NOx	VOC	CO2	PM2.5
EMass	1,091,255	19,585	23,304	71,690,725	1,604
MPO	691,414	12,418	15,208	45,410,557	1,017
Boston	88,461	1,618	2,583	5,556,814	125
Brookline	5,952	110	149	401,663	9
Cambridge	8,747	165	223	581,193	13
Chelsea	3,256	60	76	214,694	5
Everett	2,945	56	77	194,755	4
Malden	4,009	74	96	270,199	6
Medford	12,894	231	279	852,494	19
Quincy	15,881	285	360	1,058,103	24
Revere	8,275	149	185	550,236	12
Somerville	7,223	133	171	476,333	11
Waltham	12,281	217	254	820,055	18

7 Communities lbs/day	CO-W	NOx	VOC	CO2	PM2.5
2030 LPA1	285,444	5,229	7,844	18,249,444	410
2030 MPO	1,524,281	27,377	33,528	100,111,457	2,241

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
3,455	125,677,955	4,206,019	367,007,546	696,882,014	0.53	29.88
2,189	79,528,953	2,863,404	266,815,803	506,517,820	0.53	27.77
268	9,536,538	662,288	60,536,686	130,531,363	0.46	14.40
19	705,263	31,833	4,196,218	10,548,441	0.40	22.16
28	1,020,920	49,789	8,951,722	21,137,349	0.42	20.50
10	377,035	15,534	2,871,026	5,390,704	0.53	24.27
9	342,071	17,574	2,457,558	4,062,918	0.60	19.46
13	474,592	19,603	2,944,361	9,634,608	0.31	24.21
41	1,497,238	51,464	6,747,832	12,237,295	0.55	29.09
51	1,858,379	70,155	6,889,280	10,653,203	0.65	26.49
27	966,286	35,303	4,855,337	9,794,383	0.50	27.37
23	836,643	35,310	5,815,185	8,615,372	0.67	23.69
40	1,440,286	42,952	4,959,760	6,992,195	0.71	33.53

PM10	VMT	VHT	VEH	CAP	V/C	Avg MPH
881						
4,826						

Mesoscale Analysis

July 2030 Arterial SPEED	Summer VOC	Summer NOx	Summer CO	Winter CO	Summer CO2	Winter CO2	Summer/Winter PM 2.5	Summer/Winter PM 10
idle (g/hr)	3.410	0.770	23.365	43.180	1423.50	1421.88	0.0318	0.0685
	(g/mi)	(g/mi)	(g/mi)	(g/mi)	(g/m)	(g/m)	(g/m)	(g/m)
2.5	1.364	0.308	9.346	17.272	569.40	568.75	0.0127	0.0274
3.0	1.097	0.295	8.248	15.646	569.40	568.75	0.0127	0.0274
4.0	0.763	0.277	6.875	13.613	569.40	568.75	0.0127	0.0274
5.0	0.562	0.267	6.051	12.393	569.40	568.75	0.0127	0.0274
6.0	0.485	0.249	5.453	11.543	569.40	568.75	0.0127	0.0274
7.0	0.430	0.236	5.026	10.936	569.40	568.75	0.0127	0.0274
8.0	0.388	0.227	4.705	10.481	569.40	568.75	0.0127	0.0274
9.0	0.356	0.219	4.456	10.127	569.40	568.75	0.0127	0.0274
10.0	0.330	0.213	4.257	9.843	569.40	568.75	0.0127	0.0274
11.0	0.312	0.204	4.076	9.605	569.40	568.75	0.0127	0.0274
12.0	0.296	0.197	3.926	9.407	569.40	568.75	0.0127	0.0274
13.0	0.283	0.190	3.799	9.239	569.40	568.75	0.0127	0.0274
14.0	0.272	0.185	3.690	9.095	569.40	568.75	0.0127	0.0274
15.0	0.262	0.180	3.595	8.970	569.40	568.75	0.0127	0.0274
16.0	0.251	0.175	3.498	8.856	569.40	568.75	0.0127	0.0274
17.0	0.242	0.171	3.412	8.755	569.40	568.75	0.0127	0.0274
18.0	0.234	0.168	3.335	8.665	569.40	568.75	0.0127	0.0274
19.0	0.227	0.165	3.267	8.585	569.40	568.75	0.0127	0.0274
20.0	0.220	0.162	3.205	8.513	569.40	568.75	0.0127	0.0274
21.0	0.215	0.159	3.156	8.449	569.40	568.75	0.0127	0.0274
22.0	0.210	0.157	3.112	8.391	569.40	568.75	0.0127	0.0274
23.0	0.206	0.154	3.072	8.338	569.40	568.75	0.0127	0.0274
24.0	0.202	0.152	3.035	8.290	569.40	568.75	0.0127	0.0274
25.0	0.198	0.151	3.001	8.245	569.40	568.75	0.0127	0.0274
26.0	0.195	0.149	2.982	8.222	569.40	568.75	0.0127	0.0274
27.0	0.191	0.148	2.964	8.201	569.40	568.75	0.0127	0.0274
28.0	0.188	0.146	2.947	8.181	569.40	568.75	0.0127	0.0274
29.0	0.186	0.145	2.932	8.163	569.40	568.75	0.0127	0.0274
30.0	0.183	0.144	2.917	8.146	569.40	568.75	0.0127	0.0274
31.0	0.180	0.143	2.916	8.148	569.40	568.75	0.0127	0.0274
32.0	0.178	0.142	2.914	8.150	569.40	568.75	0.0127	0.0274
33.0	0.176	0.142	2.913	8.152	569.40	568.75	0.0127	0.0274
34.0	0.174	0.141	2.912	8.153	569.40	568.75	0.0127	0.0274
35.0	0.172	0.141	2.911	8.155	569.40	568.75	0.0127	0.0274
36.0	0.170	0.141	2.942	8.204	569.40	568.75	0.0127	0.0274
37.0	0.169	0.142	2.971	8.251	569.40	568.75	0.0127	0.0274
38.0	0.167	0.142	2.998	8.295	569.40	568.75	0.0127	0.0274
39.0	0.166	0.143	3.025	8.337	569.40	568.75	0.0127	0.0274
40.0	0.165	0.144	3.050	8.377	569.40	568.75	0.0127	0.0274
41.0	0.163	0.145	3.082	8.428	569.40	568.75	0.0127	0.0274
42.0	0.162	0.146	3.114	8.477	569.40	568.75	0.0127	0.0274
43.0	0.161	0.147	3.144	8.524	569.40	568.75	0.0127	0.0274
44.0	0.160	0.148	3.172	8.568	569.40	568.75	0.0127	0.0274
45.0	0.159	0.148	3.199	8.611	569.40	568.75	0.0127	0.0274
46.0	0.158	0.150	3.234	8.664	569.40	568.75	0.0127	0.0274

47.0	0.157	0.151	3.268	8.715	569.40	568.75	0.0127	0.0274
48.0	0.156	0.153	3.300	8.764	569.40	568.75	0.0127	0.0274
49.0	0.155	0.154	3.331	8.811	569.40	568.75	0.0127	0.0274
50.0	0.155	0.155	3.360	8.856	569.40	568.75	0.0127	0.0274
51.0	0.154	0.157	3.397	8.911	569.40	568.75	0.0127	0.0274
52.0	0.154	0.159	3.433	8.965	569.40	568.75	0.0127	0.0274
53.0	0.153	0.161	3.468	9.016	569.40	568.75	0.0127	0.0274
54.0	0.153	0.163	3.501	9.066	569.40	568.75	0.0127	0.0274
55.0	0.152	0.165	3.533	9.113	569.40	568.75	0.0127	0.0274
56.0	0.152	0.168	3.578	9.176	569.40	568.75	0.0127	0.0274
57.0	0.152	0.170	3.622	9.237	569.40	568.75	0.0127	0.0274
58.0	0.152	0.173	3.665	9.296	569.40	568.75	0.0127	0.0274
59.0	0.152	0.175	3.706	9.352	569.40	568.75	0.0127	0.0274
60.0	0.152	0.178	3.746	9.407	569.40	568.75	0.0127	0.0274
61.0	0.152	0.181	3.795	9.474	569.40	568.75	0.0127	0.0274
62.0	0.152	0.185	3.843	9.539	569.40	568.75	0.0127	0.0274
63.0	0.152	0.188	3.889	9.601	569.40	568.75	0.0127	0.0274
64.0	0.152	0.192	3.934	9.662	569.40	568.75	0.0127	0.0274
65.0	0.153	0.195	3.977	9.721	569.40	568.75	0.0127	0.0274

Fuel Economy (mpg)

LDGV	24.1
LDGT12 (<6000 lbs.)	18.5
LDGT34 (>6000 lbs.)	14.2
LDGT (all)	17.0
HDGV	9.9
LDDV	not calculated
LDDT	18.4
HDDV	7.3
MC	50.0
ALL	16.0

Mesoscale Analysis

July 2030 Freeway SPEED	Summer VOC (g/mi)	Summer NOx (g/mi)	Summer CO (g/mi)	Winter CO (g/mi)	Summer CO2 (g/m)	Winter CO2 (g/m)	Summer/Winter PM 2.5 (g/m)	Summer/Winter PM 10 (g/m)
2.71	1.264	0.296	8.919	16.676	569.40	568.75	0.0127	0.0274
3.0	1.121	0.289	8.331	15.805	569.40	568.75	0.0127	0.0274
4.0	0.787	0.272	6.958	13.773	569.40	568.75	0.0127	0.0274
5.0	0.587	0.262	6.134	12.553	569.40	568.75	0.0127	0.0274
6.0	0.484	0.244	5.511	11.653	569.40	568.75	0.0127	0.0274
7.0	0.427	0.225	5.029	10.968	569.40	568.75	0.0127	0.0274
8.0	0.383	0.211	4.668	10.454	569.40	568.75	0.0127	0.0274
9.0	0.350	0.200	4.387	10.054	569.40	568.75	0.0127	0.0274
10.0	0.323	0.191	4.162	9.734	569.40	568.75	0.0127	0.0274
11.0	0.302	0.183	3.976	9.475	569.40	568.75	0.0127	0.0274
12.0	0.286	0.174	3.817	9.265	569.40	568.75	0.0127	0.0274
13.0	0.272	0.166	3.683	9.086	569.40	568.75	0.0127	0.0274
14.0	0.261	0.160	3.568	8.934	569.40	568.75	0.0127	0.0274
15.0	0.251	0.154	3.468	8.801	569.40	568.75	0.0127	0.0274
16.0	0.242	0.151	3.390	8.702	569.40	568.75	0.0127	0.0274
17.0	0.234	0.150	3.341	8.653	569.40	568.75	0.0127	0.0274
18.0	0.227	0.149	3.297	8.610	569.40	568.75	0.0127	0.0274
19.0	0.220	0.148	3.258	8.571	569.40	568.75	0.0127	0.0274
20.0	0.215	0.148	3.222	8.537	569.40	568.75	0.0127	0.0274
21.0	0.210	0.147	3.192	8.505	569.40	568.75	0.0127	0.0274
22.0	0.206	0.146	3.167	8.476	569.40	568.75	0.0127	0.0274
23.0	0.202	0.146	3.144	8.449	569.40	568.75	0.0127	0.0274
24.0	0.199	0.145	3.123	8.424	569.40	568.75	0.0127	0.0274
25.0	0.196	0.145	3.104	8.402	569.40	568.75	0.0127	0.0274
26.0	0.193	0.145	3.087	8.381	569.40	568.75	0.0127	0.0274
27.0	0.190	0.144	3.070	8.362	569.40	568.75	0.0127	0.0274
28.0	0.188	0.144	3.055	8.345	569.40	568.75	0.0127	0.0274
29.0	0.185	0.144	3.041	8.329	569.40	568.75	0.0127	0.0274
30.0	0.183	0.143	3.028	8.314	569.40	568.75	0.0127	0.0274
31.0	0.181	0.143	3.023	8.311	569.40	568.75	0.0127	0.0274
32.0	0.178	0.143	3.022	8.313	569.40	568.75	0.0127	0.0274
33.0	0.176	0.143	3.021	8.316	569.40	568.75	0.0127	0.0274
34.0	0.174	0.143	3.020	8.318	569.40	568.75	0.0127	0.0274
35.0	0.173	0.142	3.020	8.321	569.40	568.75	0.0127	0.0274
36.0	0.171	0.143	3.051	8.371	569.40	568.75	0.0127	0.0274
37.0	0.170	0.144	3.080	8.417	569.40	568.75	0.0127	0.0274
38.0	0.168	0.144	3.108	8.462	569.40	568.75	0.0127	0.0274
39.0	0.167	0.145	3.134	8.503	569.40	568.75	0.0127	0.0274
40.0	0.165	0.146	3.164	8.550	569.40	568.75	0.0127	0.0274
41.0	0.164	0.147	3.197	8.602	569.40	568.75	0.0127	0.0274
42.0	0.163	0.148	3.228	8.650	569.40	568.75	0.0127	0.0274
43.0	0.162	0.149	3.258	8.697	569.40	568.75	0.0127	0.0274
44.0	0.161	0.150	3.287	8.742	569.40	568.75	0.0127	0.0274
45.0	0.160	0.151	3.324	8.798	569.40	568.75	0.0127	0.0274
46.0	0.159	0.153	3.359	8.851	569.40	568.75	0.0127	0.0274
47.0	0.158	0.154	3.392	8.902	569.40	568.75	0.0127	0.0274
48.0	0.157	0.156	3.424	8.951	569.40	568.75	0.0127	0.0274

49.0	0.156	0.158	3.462	9.008	569.40	568.75	0.0127	0.0274
50.0	0.156	0.160	3.501	9.065	569.40	568.75	0.0127	0.0274
51.0	0.155	0.162	3.538	9.121	569.40	568.75	0.0127	0.0274
52.0	0.155	0.164	3.574	9.174	569.40	568.75	0.0127	0.0274
53.0	0.154	0.166	3.616	9.235	569.40	568.75	0.0127	0.0274
54.0	0.154	0.169	3.665	9.302	569.40	568.75	0.0127	0.0274
55.0	0.154	0.172	3.712	9.368	569.40	568.75	0.0127	0.0274
56.0	0.154	0.175	3.758	9.431	569.40	568.75	0.0127	0.0274
57.0	0.154	0.178	3.806	9.497	569.40	568.75	0.0127	0.0274
58.0	0.155	0.182	3.861	9.571	569.40	568.75	0.0127	0.0274
59.0	0.155	0.186	3.913	9.642	569.40	568.75	0.0127	0.0274
60.0	0.155	0.189	3.964	9.711	569.40	568.75	0.0127	0.0274
61.0	0.155	0.192	3.999	9.758	569.40	568.75	0.0127	0.0274
62.0	0.155	0.192	3.999	9.758	569.40	568.75	0.0127	0.0274
63.0	0.155	0.192	3.999	9.758	569.40	568.75	0.0127	0.0274
64.0	0.155	0.192	3.999	9.758	569.40	568.75	0.0127	0.0274
65.0	0.155	0.192	3.999	9.758	569.40	568.75	0.0127	0.0274

Fuel Economy (mpg)

LDGV	24.1
LDGT12 (<6000 lbs.)	18.5
LDGT34 (>6000 lbs.)	14.2
LDGT (all)	17.0
HDGV	9.9
LDDV	not calculated
LDDT	18.4
HDDV	7.3
MC	50.0
ALL	16.0

April 12, 2007 Memo on Ultrafine Particulates

MEMORANDUM

To: Jay Doyle

From: W. Groot and R. Londergan

Date: 4/12/2007

Subject: Particulate Emissions from Urban Buses

Ultrafine particulates refer to that class of particulate matter with a diameter of 0.1 microns or less. Discussion of these particulates has been introduced in the consideration of particulates which may penetrate the lungs and thus affect health. Much of the information on ultrafine particulates found in our literature search reflects research on measurement techniques, test methods, and control devices. Most of the studies have analyzed emissions from only a few vehicles. This field of study has not matured to the point where standardized studies are being performed to quantify emissions from fleets of vehicles in service.

At a national level, the scientific, as well as regulatory, community has focused most recently on fine particulate matter which refers to the class of particulate matter with a diameter of 2.5 microns or less (PM2.5). This class of particulate matter represents a broader class of particulates than ultrafine particulates, and also are capable of penetrating well into the lungs. (PM2.5 includes ultrafine particulates.)

There are no areas of Massachusetts that are non-attainment for particulate matter. This includes PM2.5 , as well as PM10 (particulate matter with a diameter of 10 microns or less).

The introduction of ultralow sulfur diesel (ULSD) fuel in 2007, along with future emission standards (established under state and federal regulations) will significantly reduce fine particulate emissions, from on-road diesel powered vehicles, in future years. One reason for adopting ULSD requirements is to prolong the life of emission control devices. Also there is experimental evidence that the emissions of ultrafine PM from diesel buses are reduced by use of ULSD, even without add-on controls.

The national emissions standard for PM from heavy-duty diesel vehicles (including buses) was reduced, beginning with model year 1998, from 0.25 g/bk-hp to 0.05 g/bk-hp. Beginning with model year 2008, that emission standard has been reduced to 0.01 g/bk-hp. While these reductions are based on total PM, and are not specific to ultrafine particles, the use of ULSD and improved emission control devices will also reduce emission of ultrafine PM.

Additional studies and findings indicate that PM emissions from CNG buses can be reduced by approximately 70% - 90%, PM emissions from clean technology as ULSD/particulate filters can reduce PM emissions in the range of 80% to 90%, and hybrid electric buses can reduce PM emissions on the order of 60%.

The following table (from Diesel and CNG Heavy-duty Transit Bus Emissions over Multiple Driving Schedules: Regulated Pollutants and Project Overview, Society of Automotive Engineers, Inc, 2002-01-1722, authors A. Ayala, N. Kado, R. Okamoto, B. Holmen, P. Kuzmicky, R. Kobayashi, and K. Stiglitz) shows data from PM testing of three types of buses 1) CNG, 2) diesel bus with catalyzed muffler (Diesel

Baseline), and 3) diesel bus with diesel particulate filter. In this example ULSD fuel is used in both the diesel baseline and diesel with PM filter.

Total PM Emissions, mg/mi (SAE, 2002)*

Diesel Baseline	Diesel w/PM Filter	CNG
119.03	14.15	40

*Based on Central Business District driving cycle typical of urban bus operations

Ongoing studies conducted by the California Air Resources Board (CARB) evaluated similar vehicles for ultrafine particulate emissions. The results indicate that the combination of ultralow sulfur fuels with a particulate exhaust filter is very efficient in the removal of ultrafine particulate emissions from diesel buses.

CARB, a leader in evaluating and mitigating mobile source impacts, has developed a strategy to mitigate particulate emissions from diesel powered on-road vehicles that includes diesel engine control technology. These strategies are specifically developed to address health related issues. CARB expects their overall strategy to reduce urban bus particulate emissions in 2007 by 85% from 2002 levels. (Here California had already adopted ULSD prior to 2002.)

The New England Asthma Regional Council as part of its matrix of "Options for Reducing Pollution from School Buses" includes diesel engine emission controls for reducing the health affects of particulate emissions.

These reasons are why many cities both in the United States, and worldwide, are currently using or proposing particulate emission control strategies which include diesel buses with emission controls.

Air Quality Modeling Protocol

EarthTech
A tyco International Ltd. Company

300 Baker Avenue
Concord, MA
01742

P 978.371.4000
F 978.371.2468
www.earthtech.com

Pts/groot/urbanring/modelprotocol.doc

May 8, 2007

Ms. Christine Kirby, Chief
Transportation Management Programs
Bureau of Waste Prevention
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Subject: **Air Quality Modeling Protocol for**
Circumferential Transportation Improvements in the Urban Ring Corridor
- Phase 2 Project (EOEA # 12565)

Dear Ms. Kirby:

We respectfully request your review and approval of a proposed modeling protocol for microscale and mesoscale air quality analyses of the Circumferential Transportation Improvements in the Urban Ring Corridor - Phase 2 Project. The project involves the development of Bus Rapid Transit (BRT) facilities and service along the circumferential corridor around downtown Boston, and includes new and improved intermodal connections with radial transit and commuter rail. The project area includes portions of Boston, Brookline, Cambridge, Chelsea, Everett, Medford and Somerville.

Based on comments provided on the project, a microscale analysis will be conducted to estimate carbon monoxide (CO) impacts associated with the project, as well as a mesoscale analysis to evaluate project related pollutant emission inventories. The years analyzed will be 2006 (existing) and 2030 (future no-build and build cases). The following sections outline the approach to our study.

Microscale Analysis

The transportation analysis for the project evaluated a total of 193 intersections in the project area. Similar to the previous air quality study, three intersections from the transportation analysis will be modeled for CO concentrations; these will be selected based on Level-of-Service (LOS) and traffic volumes following EPA guidance. Currently the LOS analysis is not entirely complete. The selection process, however, will involved first identifying the 20 intersections with the highest traffic volumes. These 20 intersections will then be ranked by LOS. The two intersections with the worst LOS (with the project) will then be selected, along with the intersection with the highest traffic volume (with the project).

According to EPA guidance[1], receptors at which CO concentrations will be modeled around intersections will be situated along both sides of all roadways approaching the intersection. These receptors will be spaced three (3) meters, or approximately 10 feet, from the edge of the roadway and positioned parallel to each approach using the recommended 25 meter spacing.

The EPA MOBILE6.2.03[2] model will be used to estimate vehicle emissions based on electronic input data files provided by the Massachusetts DEP (Craig Woleader and Marc Bennett, 1/12/2007). These input files assume the following:

- Massachusetts specific Registration Distribution, by vehicle age, for all study years (2005_REG.D)
- Massachusetts specific Inspection/Maintenance Program and Cutpoints for study years 2006 and 2030 (MA_IM06.D, MA06_CUT.D, MA30_IM.D, and MA30_CUT.D)
- Anti-tampering program
  - Start Year: 2000
  - First Model Year: 1984
  - Last Model Year: 2050
  - Vehicle Types Subject to Inspection: HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B, and Gasoline Buses
  - Inspection Frequency: Biennial
  - Compliance Rate: 96%
  - Inspections Performed: All Except Tailpipe Lead Deposit, Fuel Inlet Restrictor & Evaporative System Tests
- Stage II program:
  - Start Year: 1991
  - Phase In Period: 3 Years
  - 84% System Efficiency for Refueling Emissions from LDGVs and LDGTs
  - 84% System Efficiency for Refueling Emissions from HDGVs
- Massachusetts specific phase-in fractions for Tier 2 exhaust and evaporative emission standards, and Massachusetts specific Tier 2 50,000 mile (50K) certification standards (LEV2EXH.D, LEV2EVAP.D, and LEV2CERT.D).

---

1 EPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA-454/R-92005, November, 1992.

2 USEPA, User's Guide to MOBILE6.1 and MOBILE6.2 (Mobile Source Emission Factor Model), August, 2003, EPA420-R-03-010.

- Massachusetts specific 1994 and later fleet penetration fractions for light duty gasoline vehicles under the LEV emissions standard program (MA_LEV2.D)
- Diesel rebuild effects: 0.10
- Minimum and maximum daily temperatures of 35°F and 45°F (winter)
- Absolute humidity: 75 grains/lb
- Fuel RVP of 13.5 psi (winter)
- Reformulated gasoline program for northern region
- Sulfur content of gasoline: 30 ppm (2006 and 2030)
- Sulfur content of diesel: 350 ppm (2006) and 15 ppm (2030)
- Low altitude region
- January 1st emission rates (winter)
- One average speed per roadway link - all vehicle types (using AVERAGE SPEED option with 100% arterials)

Idle mode emissions in grams per hour will be determined based on the EPA recommended procedure of multiplying the 2.5 mph emission factor, excluding start emissions, (in grams per mile) times the travel speed (2.5 mph).

Attachment 1 provides the input files to MOBILE6.2.03.

Carbon monoxide concentrations at intersections will be calculated using the CAL3QHC[3] computer program. The latest CAL3QHC code on the EPA SCRAM bulletin board will be used (the executible CAL3QHC.EXE file is dated 9/2/2004). Inputs to the CAL3QHC dispersion model will include the following:

- P-G Stability Class D
- 1.0 meter per second (m/s) wind speed.
- Wind direction modeled every 10°, from 10° to 360°.
- Mixing Height: 900 meters.

---

3 EPA, User's Guide to CAL3QHC, Version 2.0: A Modeling Methodology For Predicting Pollutant Concentrations Near Roadway Intersections, EPA-454/R-92-006, Revised, September, 1995.

- Deposition/Settling Velocity: 0.0 m/s.
- Surface Roughness (z_o): 175 cm (most buildings in the area are the height of typical office buildings).
- Averaging Time: 60 minutes.
- Source Height: 0.33 meters.
- Mixing Zone for Free Flow Links: Width of traffic lanes plus 3 meters (10 feet) on each side.
- A persistence factor of 0.7 for determining 8-hour concentrations from 1-hour CO levels.

The microscale analysis will be conducted for three cases: the existing (2006) case, the future year no-build case (2030), and the future year preferred build alternative (2030).

Background CO levels of 5.0 ppm (one-hour) and 3.0 ppm (eight-hour) will be used for both 2006 and 2030. The saturation flow rate, signal timings, signal type, and clearance time lost will be based on data provided by the traffic engineers.

In addition to the intersection modeling, Earth Tech will also be evaluating a number of roadway segments along which bus traffic is at its greatest to identify changes in CO concentrations with construction of the project. This modeling will be conducted using the CAL3QHC model similar to the intersection analysis, except that all emissions will result from free flow conditions. Also, modeling of CO concentrations from a number of the busiest bus stations will be conducted. This modeling will also use CAL3QHC for line sources, along with Halitsky's Gas Diffusion Equation and/or one of EPA's models (e.g.; AERMOD or SCREEN3) to evaluate ventilation exhaust or volume sources.

Model results for CO, including background, will be compared to the 1- and 8-hour State and National Ambient Air Quality Standards of 35 ppm (1-hour) and 9 ppm (8-hour).

Mesoscale Analysis

A mesoscale analysis will be conducted to quantify mobile source VOC, NOx, PM2.5, PM10, and CO emissions in the mesoscale study area. The mesoscale study area will include major roadway sections that make up the urban ring corridor based on the intersections that were evaluated as part of the traffic analysis. In accordance with DEP's Guidelines for Performing Mesoscale Analysis of Indirect Sources,[4] the mesoscale study area will be defined to include at

4 DEP. "Guidelines for Performing Mesoscale Analysis of Indirect Sources," May, 1991

least all roadways of the traffic study area at LOS D or worse, and where traffic increases due to the project may be 10% or greater.

Total emissions of VOC, NOx, PM2.5, PM10, and CO will be determined from those motor vehicles operating on the roadways of the mesoscale study area. The methodology for calculating predicted emissions will be based on DEP's Guidelines for Performing Mesoscale Analysis of Indirect Sources (May 1991). Vehicular emissions will be determined, by roadway link modeled, using the vehicle miles traveled (VMT) for each link and emission factors from the EPA MOBILE6.2.03 model. Vehicle miles traveled will be calculated by multiplying the roadway link length times the roadway link's average daily traffic (ADT). Total roadway emissions for the study area will be calculated by summing emissions from individual roadway links. The mesoscale analysis will be conducted for three cases: the existing (2006) case, the future year no-build case (2030), and the future year preferred build alternative (2030).

The EPA MOBILE6.2.03[5] model will be used to estimate vehicle emissions based on electronic input data files provided by the Massachusetts DEP (Craig Woleader and Marc Bennett, 1/12/2007). These input files assume the following:

- Massachusetts specific Registration Distribution, by vehicle age, for all study years (2005_REG.D)
- Massachusetts specific Inspection/Maintenance Program and Cutpoints for study years 2006 and 2030 (MA_IM06.D, MA06_CUT.D, MA30_IM.D, and MA30_CUT.D)
- Anti-tampering program
  - Start Year: 2000
  - First Model Year: 1984
  - Last Model Year: 2050
  - Vehicle Types Subject to Inspection: HDGV3, HDGV4, HDGV5, HDGV6, HDGV7, HDGV8A, HDGV8B, and Gasoline Buses
  - Inspection Frequency: Biennial
  - Compliance Rate: 96%
  - Inspections Performed: All Except Tailpipe Lead Deposit, Fuel Inlet Restrictor & Evaporative System Tests
- Stage II program:

5 USEPA, User's Guide to MOBILE6.1 and MOBILE6.2 (Mobile Source Emission Factor Model), August, 2003, EPA420-R-03-010.

- Start Year: 1991
- Phase In Period: 3 Years
- 84% System Efficiency for Refueling Emissions for LDGVs and LDGTs
- 84% System Efficiency for Refueling Emissions from HDGVs

- Massachusetts specific phase-in fractions for Tier 2 exhaust and evaporative emission standards, and Massachusetts specific Tier 2 50,000 mile (50K) certification standards (LEV2EXH.D, LEV2EVAP.D, and LEV2CERT.D).
- Massachusetts specific 1994 and later fleet penetration fractions for light duty gasoline vehicles under the LEV emissions standard program (MA_LEV2.D)
- Diesel rebuild effects: 0.10
- Minimum and maximum daily temperatures of 68°F and 94°F for summer
- Absolute humidity: 75 grains/lb
- Fuel RVP of 6.8 psi for summer
- Reformulated gasoline program for northern region
- Sulfur content of gasoline: 30 ppm (2006 and 2030)
- Sulfur content of diesel: 350 ppm (2006) and 15 ppm (2030)
- Low altitude region
- July 1st emission rates for summer
- One average speed per roadway link - all vehicle types (using AVERAGE SPEED option with 100% arterials)

For the BRT buses in 2030, MOBILE6.2.03 HDDV emissions will be used unless better data are available from bus vendors.

Results comparing total VOC, NOx, PM2.5, PM10, and CO emissions of the preferred build case with those of the existing and no-build cases will be presented in the Draft EIR.

Finally, as outlined in EOEA's Certificate on the Phase 2 DEIR, the project will commit to retrofit of off-road diesel construction equipment and use of Low Sulfur Diesel Fuel as required under the Administrative Consent Order between DEP and EOT.

EarthTech

A tyco International Ltd. Company

If this protocol meets with your approval, we would appreciate confirmation as soon as possible. Thank you for your time and assistance.

Very truly yours,
EARTH TECH

William Groot, CCM

Attachment

ATTACHMENT 1 - MOBILE6.2.03 Input Files

```
* Calendar Year 2006 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses
* Filename MA05_MES.INP created on 10/7/05 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
* revised 12/2/05 to include actual diesel rebuild effects
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : HC CO NOX
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA06_MES.tb1 REPLACE
REPORT FILE         : MA06_MES.txt REPLACE
*
RUN DATA
***************     Run Section #1     ***************
> *** Summer 2006 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA_IM06.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 68. 94.

* Fuel inputs
FUEL RVP            : 6.8
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.003   0.003   0.002   0.002   0.002   0.002   0.001
0.001   0.001   0.000   0.001   0.001   0.003   0.001   0.002   0.000   0.015
0.009   0.056   0.070   0.119   0.136
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.176   0.176   0.176   0.170   0.207   0.202   0.206   0.243   0.176   0.285
0.267   0.212   0.255   0.295   0.249   0.251   0.188   0.175   0.182   0.186
0.219   0.184   0.170   0.143   0.140
0.385   0.385   0.385   0.407   0.433   0.467   0.464   0.480   0.375   0.472
0.480   0.366   0.400   0.344   0.285   0.333   0.314   0.253   0.208   0.197
0.168   0.130   0.106   0.114   0.087
0.674   0.674   0.674   0.634   0.664   0.719   0.717   0.744   0.715   0.565
```

```
0.810   0.803   0.644   0.654   0.605   0.525   0.389   0.356   0.376   0.108
0.136   0.154   0.148   0.120   0.000
0.830   0.830   0.830   0.845   0.860   0.840   0.819   0.813   0.610   0.686
0.570   0.733   0.607   0.729   0.685   0.725   0.631   0.350   0.305   0.186
0.209   0.343   0.091   0.175   0.200
0.884   0.884   0.884   0.840   0.887   0.931   0.917   0.914   0.923   0.901
0.908   0.898   0.903   0.876   0.804   0.844   0.782   0.702   0.679   0.554
0.529   0.568   0.628   0.571   0.583
0.977   0.977   0.977   0.972   0.953   0.993   0.992   0.992   0.990   0.981
0.976   0.975   0.959   0.982   0.965   0.963   0.945   0.902   0.875   0.857
0.791   0.796   0.846   0.805   0.879
0.972   0.972   0.972   0.955   0.984   0.995   0.992   0.991   0.995   0.993
0.993   0.995   0.992   0.986   0.995   0.981   0.993   0.971   0.982   0.977
0.993   0.987   0.986   0.988   0.967
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.917   0.884   0.925   0.968   0.961   0.972   0.985
0.971   0.941   0.905   0.965   0.940   0.907   0.964   0.609   0.880   1.000
0.778   0.500   1.000   0.000   0.000

***************     Scenario Section     ***************

SCENARIO RECORD     : 2006 DEFAULT SPEED - Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7

SCENARIO RECORD     : 2006 Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0
```

```
SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Summer
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************      End of This Run      ***************
END OF RUN
```

```
* Calendar Year 2006 Generic MOBILE6 input file for Microscale Build/No-Build Analyses
* Filename MA05_MES.INP created on 10/7/05 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
* revised 12/2/05 to include actual diesel rebuild effects
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA06_MIC.tbl REPLACE
REPORT FILE         : MA06_MIC.txt REPLACE
*
RUN DATA

***************     Run Section #2     ***************
> *** Winter 2006 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA_IM06.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 35. 45.

* Fuel inputs
FUEL RVP            : 13.5
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.003   0.003   0.002   0.002   0.002   0.002   0.001
0.001   0.001   0.000   0.001   0.001   0.003   0.001   0.002   0.000   0.015
0.009   0.056   0.070   0.119   0.136
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.176   0.176   0.176   0.170   0.207   0.202   0.206   0.243   0.176   0.285
0.267   0.212   0.255   0.295   0.249   0.251   0.188   0.175   0.182   0.186
0.219   0.184   0.170   0.143   0.140
0.385   0.385   0.385   0.407   0.433   0.467   0.464   0.480   0.375   0.472
0.480   0.366   0.400   0.344   0.285   0.333   0.314   0.253   0.208   0.197
0.168   0.130   0.106   0.114   0.087
```

0.674	0.674	0.674	0.634	0.664	0.719	0.717	0.744	0.715	0.565
0.810	0.803	0.644	0.654	0.605	0.525	0.389	0.356	0.376	0.108
0.136	0.154	0.148	0.120	0.000					
0.830	0.830	0.830	0.845	0.860	0.840	0.819	0.813	0.610	0.686
0.570	0.733	0.607	0.729	0.685	0.725	0.631	0.350	0.305	0.186
0.209	0.343	0.091	0.175	0.200					
0.884	0.884	0.884	0.840	0.887	0.931	0.917	0.914	0.923	0.901
0.908	0.898	0.903	0.876	0.804	0.844	0.782	0.702	0.679	0.554
0.529	0.568	0.628	0.571	0.583					
0.977	0.977	0.977	0.972	0.953	0.993	0.992	0.992	0.990	0.981
0.976	0.975	0.959	0.982	0.965	0.963	0.945	0.902	0.875	0.857
0.791	0.796	0.846	0.805	0.879					
0.972	0.972	0.972	0.955	0.984	0.995	0.992	0.991	0.995	0.993
0.993	0.995	0.992	0.986	0.995	0.981	0.993	0.971	0.982	0.977
0.993	0.987	0.986	0.988	0.967					
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000	1.000					
0.786	0.786	0.786	0.917	0.884	0.925	0.968	0.961	0.972	0.985
0.971	0.941	0.905	0.965	0.940	0.907	0.964	0.609	0.880	1.000
0.778	0.500	1.000	0.000	0.000					

********** Scenario Section **********

SCENARIO RECORD : 2006 DEFAULT SPEED - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1

SCENARIO RECORD : 2006 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1
AVERAGE SPEED : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Scenario - Winter
CALENDAR YEAR : 2006
EVALUATION MONTH : 1

```
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2006 Scenario - Winter
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN
```

```
* Calendar Year 2006 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses, Ozone, CO,
and PM
* Filename MA06PM03.INP created on 6/2/06 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES        :
POLLUTANTS          : HC CO NOX CO2
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA06PM03.tbl REPLACE
REPORT FILE         : MA06PM03.txt REPLACE
*
RUN DATA
***************     Run Section #1     ***************
> *** Summer 2006 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA_IM06.D

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 68. 94.

* Fuel inputs
FUEL RVP            : 6.8
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.003   0.003   0.002   0.002   0.002   0.002   0.001
0.001   0.001   0.000   0.001   0.001   0.003   0.001   0.002   0.000   0.015
0.009   0.056   0.070   0.119   0.136
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.176   0.176   0.176   0.170   0.207   0.202   0.206   0.243   0.176   0.285
0.267   0.212   0.255   0.295   0.249   0.251   0.188   0.175   0.182   0.186
0.219   0.184   0.170   0.143   0.140
0.385   0.385   0.385   0.407   0.433   0.467   0.464   0.480   0.375   0.472
0.480   0.366   0.400   0.344   0.285   0.333   0.314   0.253   0.208   0.197
0.168   0.130   0.106   0.114   0.087
```

```
0.674   0.674   0.674   0.634   0.664   0.719   0.717   0.744   0.715   0.565
0.810   0.803   0.644   0.654   0.605   0.525   0.389   0.356   0.376   0.108
0.136   0.154   0.148   0.120   0.000
0.830   0.830   0.830   0.845   0.860   0.840   0.819   0.813   0.610   0.686
0.570   0.733   0.607   0.729   0.685   0.725   0.631   0.350   0.305   0.186
0.209   0.343   0.091   0.175   0.200
0.884   0.884   0.884   0.840   0.887   0.931   0.917   0.914   0.923   0.901
0.908   0.898   0.903   0.876   0.804   0.844   0.782   0.702   0.679   0.554
0.529   0.568   0.628   0.571   0.583
0.977   0.977   0.977   0.972   0.953   0.993   0.992   0.992   0.990   0.981
0.976   0.975   0.959   0.982   0.965   0.963   0.945   0.902   0.875   0.857
0.791   0.796   0.846   0.805   0.879
0.972   0.972   0.972   0.955   0.984   0.995   0.992   0.991   0.995   0.993
0.993   0.995   0.992   0.986   0.995   0.981   0.993   0.971   0.982   0.977
0.993   0.987   0.986   0.988   0.967
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.917   0.884   0.925   0.968   0.961   0.972   0.985
0.971   0.941   0.905   0.965   0.940   0.907   0.964   0.609   0.880   1.000
0.778   0.500   1.000   0.000   0.000
```

********** Scenario Section **********

```
SCENARIO RECORD     : PM 2.5 - Summer 20 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 25 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 30 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 35 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 40 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 45 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
```

```
AVERAGE SPEED       : 45 Arterial 0.0 100.0 0.0 0.0


SCENARIO RECORD     : PM 10 - Summer 20 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Summer 25 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Summer 30 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Summer 35 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Summer 40 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Summer 45 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 45 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN


***************     Run Section #2     ***************
> *** Winter 2006 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA_IM06.D

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10
```

```
STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP          : MA_LEV2.D
T2 EXH PHASE-IN      : LEV2EXH.D
T2 EVAP PHASE-IN     : LEV2EVAP.D
T2 CERT              : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP         : 35. 45.

* Fuel inputs
FUEL RVP             : 13.5
FUEL PROGRAM         : 2 N

DIESEL FRACTIONS     :
0.000   0.000   0.000   0.003   0.003   0.002   0.002   0.002   0.002   0.001
0.001   0.001   0.000   0.001   0.001   0.003   0.001   0.002   0.000   0.015
0.009   0.056   0.070   0.119   0.136
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.000   0.001
0.001   0.001   0.001   0.001   0.001   0.002   0.002   0.003   0.003   0.006
0.013   0.017   0.019   0.020   0.064
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.006   0.005   0.012
0.012   0.017   0.015   0.014   0.016   0.017   0.014   0.018   0.016   0.021
0.048   0.065   0.060   0.066   0.101
0.176   0.176   0.176   0.170   0.207   0.202   0.206   0.243   0.176   0.285
0.267   0.212   0.255   0.295   0.249   0.251   0.188   0.175   0.182   0.186
0.219   0.184   0.170   0.143   0.140
0.385   0.385   0.385   0.407   0.433   0.467   0.464   0.480   0.375   0.472
0.480   0.366   0.400   0.344   0.285   0.333   0.314   0.253   0.208   0.197
0.168   0.130   0.106   0.114   0.087
0.674   0.674   0.674   0.634   0.664   0.719   0.717   0.744   0.715   0.565
0.810   0.803   0.644   0.654   0.605   0.525   0.389   0.356   0.376   0.108
0.136   0.154   0.148   0.120   0.000
0.830   0.830   0.830   0.845   0.860   0.840   0.819   0.813   0.610   0.686
0.570   0.733   0.607   0.729   0.685   0.725   0.631   0.350   0.305   0.186
0.209   0.343   0.091   0.175   0.200
0.884   0.884   0.884   0.840   0.887   0.931   0.917   0.914   0.923   0.901
0.908   0.898   0.903   0.876   0.804   0.844   0.782   0.702   0.679   0.554
0.529   0.568   0.628   0.571   0.583
0.977   0.977   0.977   0.972   0.953   0.993   0.992   0.992   0.990   0.981
0.976   0.975   0.959   0.982   0.965   0.963   0.945   0.902   0.875   0.857
0.791   0.796   0.846   0.805   0.879
0.972   0.972   0.972   0.955   0.984   0.995   0.992   0.991   0.995   0.993
0.993   0.995   0.992   0.986   0.995   0.981   0.993   0.971   0.982   0.977
0.993   0.987   0.986   0.988   0.967
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.917   0.884   0.925   0.968   0.961   0.972   0.985
0.971   0.941   0.905   0.965   0.940   0.907   0.964   0.609   0.880   1.000
0.778   0.500   1.000   0.000   0.000

***************      Scenario Section      ***************

SCENARIO RECORD      : PM 2.5 - Winter 20 mph
CALENDAR YEAR        : 2006
EVALUATION MONTH     : 1
PARTICULATE EF       : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE        : 2.5
DIESEL SULFUR        : 350
AVERAGE SPEED        : 20 Arterial 0.0 100.0 0.0 0.0
```

```
SCENARIO RECORD     : PM 2.5 - Winter 25 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Winter 30 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Winter 35 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Winter 40 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Winter 45 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 350
AVERAGE SPEED       : 45 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Winter 20 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Winter 25 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Winter 30 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Winter 35 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 35 Arterial 0.0 100.0 0.0 0.0
```

```
SCENARIO RECORD     : PM 10 - Winter 40 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 10 - Winter 45 mph
CALENDAR YEAR       : 2006
EVALUATION MONTH    : 1
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 10
DIESEL SULFUR       : 350
AVERAGE SPEED       : 45 Arterial 0.0 100.0 0.0 0.0

**********      End of This Run      **********
END OF RUN
```

```
* Calendar Year 2030 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses
* Filename MA30_MES.INP created on 12/9/05 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : HC CO NOX
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA30_MES.tb1 REPLACE
REPORT FILE         : MA30_MES.txt REPLACE
*
RUN DATA
***************     Run Section #1     ***************
> *** Summer 2030 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA30_IM.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING  :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 68. 94.

* Fuel inputs
FUEL RVP            : 6.8
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
0.385   0.385   0.385   0.385   0.385
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
```

```
0.674   0.674   0.674   0.674   0.674
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786

**********      Scenario Section      **********

SCENARIO RECORD     : 2030 DEFAULT SPEED - Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7

SCENARIO RECORD     : 2030 Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0
```

```
SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Summer
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN
```

```
* Calendar Year 2030 Generic MOBILE6 input file for Microscale Build/No-Build Analyses
* Filename MA30_MIC.INP 'created on 12/9/05 by Craig Woleader, MADEP 617-348-4046,
craig.woleader@state.ma.us
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS          : CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA30_MIC.tbl REPLACE
REPORT FILE         : MA30_MIC.txt REPLACE
*
RUN DATA
***************     Run Section #2     ***************
> *** Winter 2030 ***

* Pollutant output format
EXPRESS HC AS VOC   :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA30_IM.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING  :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 35. 45.

* Fuel inputs
FUEL RVP            : 13.5
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
0.385   0.385   0.385   0.385   0.385
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
```

```
0.674   0.674   0.674   0.674   0.674
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786

**********      Scenario Section      **********

SCENARIO RECORD     : 2030 DEFAULT SPEED - Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1

SCENARIO RECORD     : 2030 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 5.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 10.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 15.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 25.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 30.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 40.0 Arterial 0.0 100.0 0.0 0.0
```

```
SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 45.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 50.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 55.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 60.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : 2030 Winter
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
AVERAGE SPEED       : 65.0 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN
```

```
* Calendar Year 2030 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses, Ozone, CO,
and PM
* Filename MA30PM03.INP created on 8/2/06 by Marc Bennett, MADEP 617-292-5597,
marc.bennett@state.ma.us
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES        :
POLLUTANTS          : HC CO NOX
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : MA30PM03.tb1 REPLACE
REPORT FILE         : MA30PM03.txt REPLACE
*
RUN DATA
***************     Run Section #1     ***************
> *** Summer 2030 ***

* Pollutant output format
EXPRESS HC AS VOC   :
EXPAND HDDV EFS     :

* Mass. specific user inputs -- require external data file
REG DIST            : 2005_REG.D
I/M DESC FILE       : MA30_IM.D

ANTI-TAMP PROG      :
00 84 50 11111 12222222 2 12 096. 22112122

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS     : 0.10

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP         : MA_LEV2.D
T2 EXH PHASE-IN     : LEV2EXH.D
T2 EVAP PHASE-IN    : LEV2EVAP.D
T2 CERT             : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP        : 68. 94.

* Fuel inputs
FUEL RVP            : 6.8
FUEL PROGRAM        : 2 N

DIESEL FRACTIONS    :
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
0.000   0.000   0.000   0.000   0.000
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
0.001   0.001   0.001   0.001   0.001
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005   0.005
0.005   0.005   0.005   0.005   0.005
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176   0.176
0.176   0.176   0.176   0.176   0.176
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385   0.385
```

```
0.385   0.385   0.385   0.385   0.385
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674   0.674
0.674   0.674   0.674   0.674   0.674
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830   0.830
0.830   0.830   0.830   0.830   0.830
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884   0.884
0.884   0.884   0.884   0.884   0.884
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977   0.977
0.977   0.977   0.977   0.977   0.977
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972   0.972
0.972   0.972   0.972   0.972   0.972
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000
1.000   1.000   1.000   1.000   1.000
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786   0.786
0.786   0.786   0.786   0.786   0.786

**********      Scenario Section      **********

SCENARIO RECORD     : PM 2.5 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 15
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 10 mph
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 15
AVERAGE SPEED       : 10 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 15 mph
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 15
AVERAGE SPEED       : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 20 mph
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 15
AVERAGE SPEED       : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 25 mph
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
DIESEL SULFUR       : 15
AVERAGE SPEED       : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : PM 2.5 - Summer 30 mph
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 7
PARTICULATE EF      : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE       : 2.5
```

```
DIESEL SULFUR      : 15
AVERAGE SPEED      : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Summer 35 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Summer 40 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Summer 45 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 45 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Summer 50 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 50 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 10 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 10 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 15 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 20 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 25 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
```

```
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 30 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 35 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 40 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 45 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 45 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Summer 50 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 7
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 50 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN


***************     Run Section #2     ***************
> *** Winter 2030 ***

* Pollutant output format
EXPRESS HC AS VOC  :
EXPAND HDDV EFS    :

* Mass. specific user inputs -- require external data file
REG DIST           : 2005_REG.D
I/M DESC FILE      : MA30_IM.D

ANTI-TAMP PROG     :
00 84 50 11111 12222222 2 12 096. 22112122

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS    : 0.10

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP        : MA_LEV2.D
T2 EXH PHASE-IN    : LEV2EXH.D
```

T2 EVAP PHASE-IN : LEV2EVAP.D
T2 CERT : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP : 35. 45.

* Fuel inputs
FUEL RVP : 13.5
FUEL PROGRAM : 2 N

DIESEL FRACTIONS :

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000					
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
0.001	0.001	0.001	0.001	0.001					
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
0.001	0.001	0.001	0.001	0.001					
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
0.005	0.005	0.005	0.005	0.005					
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
0.005	0.005	0.005	0.005	0.005					
0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176
0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176	0.176
0.176	0.176	0.176	0.176	0.176					
0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385	0.385
0.385	0.385	0.385	0.385	0.385					
0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674
0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674	0.674
0.674	0.674	0.674	0.674	0.674					
0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830
0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830
0.830	0.830	0.830	0.830	0.830					
0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884
0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884	0.884
0.884	0.884	0.884	0.884	0.884					
0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977
0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977
0.977	0.977	0.977	0.977	0.977					
0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972
0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972	0.972
0.972	0.972	0.972	0.972	0.972					
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000	1.000					
0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786
0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786	0.786
0.786	0.786	0.786	0.786	0.786					

********** Scenario Section **********

SCENARIO RECORD : PM 2.5 - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : PM 2.5 - Winter 10 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

```
AVERAGE SPEED      : 10 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 15 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 20 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 25 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 30 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 35 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 40 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 45 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 45 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 2.5 - Winter 50 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 2.5
DIESEL SULFUR      : 15
AVERAGE SPEED      : 50 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
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DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 10 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 10 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 15 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 20 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 25 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 30 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 35 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 40 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 40 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 45 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 15
AVERAGE SPEED      : 45 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD    : PM 10 - Winter 50 mph
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
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PARTICLE SIZE       : 10
DIESEL SULFUR       : 15
AVERAGE SPEED       : 50 Arterial 0.0 100.0 0.0 0.0

***************      End of This Run      ***************
END OF RUN
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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

ARLEEN O'DONNELL
Commissioner

June 28, 2007

William Groot
EarthTech
300 Baker Avenue
Concord, MA
01742

EOEA 12565

Dear Mr. Groot:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the proposed modeling protocol and intersection selection procedure submitted on May 8, 2007 for the Circumferential Transportation Improvements in the Urban Ring Corridor. For the project study area, the selected roadway links and the roadway intersections satisfy MassDEP's guidelines for conducting mesoscale and microscale air quality analyses, respectively. Therefore, MassDEP approves the proposed modeling protocol and intersection selection procedure.

When submitting the Draft Environmental Impact Report (DEIR) or Single Environmental Impact Report (SEIR) to the Massachusetts Environmental Policy Act (MEPA) Office, please provide the following to jerome.grafe@state.ma.us of our office:

- An electronic copy of the mesoscale air quality modeling results, including all MOBILE input and output files; and
- An electronic copy of the microscale modeling results, including all MOBILE input and output files, and the input file for the CAL3QHC model.
- A diagram of the selected intersections and receptor locations based on the completed LOS analysis

If you have any questions, please contact Jerome Grafe at 617-292-5708 or jerome.grafe@state.ma.us